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TRANSACTIONS

OF THE

MEDICAL AND PHYSICAL SOCIETY

OF

BOMBAY.

No. II.—NEW SERIES.

FOR THE YEARS 1853 & 1854.

Bombay:

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A

CLINICAL REPORT

ON THE

CASES OF PNEUMONIA TREATED IN THE CLINICAL WARD OF THE JAMSETJEE JEJEEBHOY HOSPITAL, DURING THE SIX YEARS FROM 1848 TO 1853.

BY C. MOREHEAD, M.D.,
Professor of Medicine, Grant Medical College.

Presented October 1853.

DURING the six years from 1848 to 1853, 76 cases of primary pneumonia, and 27* of pneumonia complicating intermittent or remittent fever, have been treated in the clinical ward. The record of these cases is full and accurate. They were all under my immediate observation. My remarks, therefore, will chiefly have reference to them; yet I shall not hesitate occasionally to refer to my own experience, or that of others, in this disease, in other wards of the hospital.

My present subject, then, is not the general history of pneumonia, nor, indeed, that of all the circumstances of the disease which I have myself witnessed, but merely a description of it as it occurs in the hospital-frequenting classes of the Native community of Bombay.

The account of primary pneumonia, and of that which complicates malarious fever, have been included in one report. This arrangement has been adopted because questions may arise relative to the pathology, symptoms, and treatment of inflammation of the lungs, in the consideration of which a comparison of the two forms may be found useful.

I shall use the term "*Primary Pneumonia*" in its generally

* Of these 23 complicated remittent fever, and 4 intermittent fever.

received sense. For convenience sake, I shall designate by the term "*Febrile*" the pneumonia which has been observed as a complication of intermittent and remittent fever: in this restricted sense the term must be understood when used in this report.

The points of interest in the 103 cases admitted into the clinical ward during the period included in this report, and the reflections to which they give rise, are arranged under the following heads:—1*st*,—Etiology; 2*nd*,—Pathology; 3*rd*,—Symptoms; 4*th*,—Treatment.

Etiology.

Sex.—The question of the influence of difference of sex in creating a predisposition to pneumonia will not receive any elucidation from these cases—they are all of males.

Age.—The greater or less prevalence and mortality of this disease at different periods of life is a subject of interesting inquiry. This report, however, will not tend much to advance it. The hospital is for the reception of adults. The hospital-frequenting classes chiefly consist of day-labourers, peons, cart-drivers, domestic servants, and sailors. Many of them are natives of other parts of the country, who resort to Bombay for a season, in pursuit of the means of subsistence. They are chiefly individuals in the vigour of life. Of the subjects of our present cases, 57 were between the ages of 21 and 30; 22 between 31 and 40; only 11 between 10 and 20; and 9 above 40.

Caste.—The castes from which these clinical patients were selected have been, with one exception, Hindoos, Mussulmans, and Native Christians: there are 49 Hindoos, 40 Mussulmans, and 13 Native Christians. This is about the ratio of the total hospital admissions of these castes. In this statement, then, there is no evidence of liability to pneumonia being caused by peculiarities in the customs of these different classes. Yet there is an interesting fact to be deduced from these cases, which is probably related to caste customs. The mortality among the Hindoos and Mussulmans has been about one in three; that of the Native Christians not quite one in six. On referring to the duration of the disease before admission, I find that of the 71

recovered cases, only 20 were admitted within five days of the commencement of illness: of these 9 are Native Christians. From this statement, then, it is a fair inference, that though pneumonia has been as prevalent among the Native Christians as the other two castes, it has been much more successfully treated, in consequence of the earlier application for relief.

Habits, and State of Constitution.—The state of constitution, and the habits of these patients, have in all probability had a share in causing the disease. Of 101, whose state of constitution on admission is noted, 63 were asthenic, and the condition of 38 is stated to have been good, or tolerable. Of the asthenic patients, about one in three died; of the others about one in four.

The habits of 77 are stated: of these, 46 allowed that they were in the practice of using spirituous liquors; 31 denied it.

Seasons.—On referring to the total hospital admissions of primary pneumonia, during the six years to which this report relates, it is found that in the year 1849 the number was one-third more than the average of the other years. On comparing the monthly admissions for the whole period, it appears that in the six months from December to May the admissions were 189; but in the six months from June to November 120—a difference of 69 in favour of the winter and spring. These results are deduced from the consideration of 309 cases.

In M. Grisolle's elaborate work on pneumonia, there is a table* which exhibits the months of admission in Paris of 296

* The statements in detail are subjoined:—

	Bombay.	Paris.
January	30	20
February	39	40
March	32	47
April	27	62
May	27	40
June	23	8
July	9	13
August	18	3
September	21	5
October	29	2
November	20	22
December	34	34
	309	296

cases. It will be useful to compare these statements, with the view of determining to what extent there is correspondence or difference in the seasons of greatest prevalence of pneumonia in the climates of Paris and Bombay. In both we find the disease more common in the six months from December to May than in those from June to November. But the difference is more marked in one climate than in the other. In Paris it is 190, in Bombay 69. When the month of November is excluded, and the admissions in the two places from June to October are compared, it appears that in Bombay there were 100, in Paris 31.

There is, then, in Bombay, a greater proportion of admissions in the summer and first half of autumn than in Paris. The cause is evident: June, July, August, and September are the monsoon months in Bombay—the season of the periodical rains. We have at this time wet, a moist atmosphere, and high winds, as causes of reduction of the temperature of the surface of the body.

These remarks have had reference to primary pneumonia. But when we regard the periods of admission of the 27 cases of *febrile* pneumonia included in this report, we find that the greatest monthly number is in July. When we compare the six months from June to November with those from December to May, we find that the admissions in the former have been 22, in the latter only 5. The difference between the seasons of greatest prevalence of primary and febrile pneumonia in Bombay would seem to be well marked. The explanation is plain: primary pneumonia is most common in the cold months of the year; febrile pneumonia, on the other hand, is necessarily most common in the months in which malarious fevers prevail most. This fact is important, as it may facilitate the diagnosis of the two forms. It is of importance to establish this diagnosis, from the bearing which we shall find it has on the treatment of the disease.

Causes assigned.—The patients have not in many instances attributed the attack to any particular cause: 9 traced it to cold or wet, 8 to fatigue and exposure, and 10 to blows more or less recently received. When we consider the season of greatest

prevalence of the primary form, the occupations of the inmates of the hospital, their exposure to vicissitudes of weather, their scanty clothing, and defective habitations, we are probably justified in regarding reduction of the temperature of the surface of the body as the common exciting cause of pneumonia here as elsewhere.

Pathology.

Before stating the important facts of these cases which may be most conveniently classed under this division, I am desirous of making a few general observations on the pathology of pneumonia. I am induced to follow this course in order that my subsequent remarks may be the better understood.

The first question that seems to me naturally to suggest itself relative to the pathology of pneumonia is the determination of the precise seat of the inflammation. I do not mean the question of whether the walls of the pulmonary air cells or their connecting areolar tissue be the structures affected with inflammatory action. This, though much discussed by pathologists, has never appeared to me a very important or difficult point to determine: if in inflammation of mucous and serous membranes we very generally find that the deranged action tends to extend to the areolar tissue subjacent to them, and to cause inflammatory deposits, more or less in different cases, to take place there, it is improbable that inflammation of the pulmonary cell walls can exist without tending to extend to, and cause deposits to take place more or less in the areolar tissue which connects the cells together, as well as into the cells themselves. The question to which I allude is, whether the capillaries of the bronchial arteries or those of the pulmonary artery are the seat of that deranged state of capillary circulation to which pathologists have applied the term inflammation. The answer appears to me simple and evident: if we adopt the opinion at present generally received, that inflammation is an altered state of the nutritive processes of the part affected, depending upon something faulty in one or other of the conditions of normal nutrition, then the capillaries concerned in inflammation must necessarily be only such as

circulate in their normal state arterial blood for purposes of nutrition. The capillaries of the bronchial arteries are the nutrient vessels of the visceral pleura, of the mucous lining and other structures of the bronchial tubes, and of the connecting areolar tissue of the constituent parts of the lungs. We cannot avoid the conclusion that they are the nutrient vessels of the pulmonary cell walls also. These capillaries are unquestionably those involved in visceral pleuritis, and in bronchitis. It would seem to be an unavoidable conclusion, that they must also be the capillaries concerned when the inflammation is of the pulmonary cell walls, and of the areolar tissue that connects the cells to each other.

The capillaries of the pulmonary artery, on the other hand, convey venous blood to the air cells, to be distributed on their walls, in order that the physical process of endosmosis and exosmosis may take place between the gases of the blood and of the atmospheric air. It cannot be looked upon as probable that the blood in these capillaries takes any part in the vital processes of nutrition of the cell walls. It is, therefore, a just conclusion, that these capillaries and their blood cannot be agents in the altered state of nutrition of the pulmonary cell walls, and their connecting areolar tissue, which we designate by the term pneumonia. Though the capillaries of the pulmonary artery are not the inflamed capillaries, yet their deranged action has much to do with the pathology of pneumonia.

The phenomena which attend on the first inspiration after birth, on asphyxia, vesicular emphysema, and other pathological states of the lungs, teach us the following facts :—

1*st*.—That the pulmonary capillary circulation is contingent on the processes between the blood in the pulmonary capillaries and the air in the pulmonary air cells being in action.

2*nd*.—If this aeration of the blood is impeded from want of a sufficient air supply, or from thickening of the cell walls, or the cells becoming filled with liquid, or solid deposits, then the pulmonary capillary circulation on such cell walls becomes languid, and soon stops—the blood distends the vessels, and stagnates in them. Now additional blood is no longer sent into the

branches of the pulmonary artery, which conduct to these defective cells; it passes in excessive quantity into the adjoining branches, to be conveyed to the capillaries of the adjoining healthy cells, in order that it may be aerated there. If, however, the blood thus sent in excessive quantity to these adjoining healthy cells be greater than the extent of surface can readily aerate, then dyspnœa is caused. Short and hurried respirations merely express the fact that all the cells of the lungs are not admitting air, and that the diminished extent of surface thus arising is being compensated for by the greater frequency of the respiratory acts. Difficulty of breathing is only experienced when there is want of just relation between the quantity of blood in the vascular system and the extent of the effective pulmonary surface.

Let us now endeavour to apply these principles to the pathology of the disease before us.

When the pulmonary cell walls become somewhat thickened, from the turgescent state of the bronchial capillaries, and when secretions are present in the cells, in the degree which interferes with, but does not altogether prevent the admission of air, then we may believe that some degree of aeration is still carried on; the pulmonary capillaries become somewhat distended; the circulation of the blood in them is impeded, but is as yet not altogether obstructed. Such I believe to be the condition of the lung in the first stage of pneumonia. The inflammation continues; the thickening of the cell walls increases; the inflammatory deposits take place in greater abundance in the cells, and now the aeration of the blood at these cells becomes physically impracticable; the pulmonary capillaries become turgid with stagnated blood; the circulation in them has become altogether obstructed. Such I believe is the state of the lung in the second stage of pneumonia. Its spongy structure has become solid; the solidification depending, in part, it may be assumed, on inflammatory exudation into the cells, in part also, however, on the stagnated blood in the close-set meshes of the pulmonary capillaries. This latter condition of consolidation is not, I think, stated with sufficient prominence by pathological writers on this disease. It explains well how the consolidation

of the lung sometimes takes place rapidly, and how, when it has occurred, it sometimes is very speedily removed. It is evident that if part of the consolidated condition of the lung has depended on pulmonary capillaries turgid with blood stagnated, but not coagulated, and aeration becomes re-established in the affected cells by reduction of the inflammation, then this stagnating blood will at once be set in motion, and the consolidation that depended upon it be speedily removed.

My belief, then, is, that the capillaries of the pulmonary artery are not the inflamed capillaries of pneumonia; but consequent on inflammation of the pulmonary cell walls, the action of the pulmonary capillaries becomes deranged in the manner explained. This derangement constitutes the danger of pneumonia, as of all other forms of pulmonary disease. Moreover, the deranged action of the pulmonary capillaries takes a part in producing the striking morbid appearance of the lung in pneumonia—I mean its hepatization.

In this view of the pathology of pneumonia, we have also a satisfactory explanation of the relation between hypostatic consolidation of the lung, and the hepatization of pneumonia. In hepatization, there is in the pulmonary capillary turgescence present, the condition of hypostatic consolidation; but there is also, in addition, the consolidating conditions derived from the direct products of inflammation.

Perhaps I have dwelt too long on these speculations;* yet, as we shall presently find, they have an important reference to symptoms, as well as to questions of treatment.

* I have never been able to understand why writers on the pathology of pneumonia have so seldom explicitly alluded to the question of which set of capillaries is engaged in the inflammation of pneumonia. Dr. Williams is the only writer who to my knowledge does so. In his article on pneumonia in the "Cyclopædia of Practical Medicine" he observes:—"These examinations, and some pathological considerations, induce us to consider the capillary ramifications of the pulmonary artery and veins to be the proper seat of pneumonia, and that these may involve more or less of the tissues through and around which they pass." This statement is not repeated, to my knowledge, in the subsequent writings of this author in the "Library of Medicine."

I now leave this digression, and return to my proper subject.

Rate of Mortality.—Let us consider the rate of mortality of these cases of pneumonia, marking the distinction between the primary and febrile forms.

There are 76 cases of primary pneumonia. Of these 24 died. If we exclude from calculation 2 cases fatal from cholera,* it leaves a mortality of nearly 29 per cent.

There are 27 cases of febrile pneumonia. Of these 8 died. In 2 of them the fatal result was caused more from co-existing meningitis than from pneumonia; yet, in estimating the rate of mortality of this form, we may not exclude any of the usual contingencies of malarious fever. The rate of mortality of the febrile cases is not quite 30 per cent.

The rate of mortality of primary pneumonia has been nearly as high as that of the febrile form. From this we are probably justified in assuming that pneumonic inflammation, when complicating malarious fever, is not so severe in character as when it occurs in its primary form. Were this not the case, the mortality of the febrile form would be higher, for we must attribute it in part to those other conditions of idiopathic fever which tend to cause death, and not exclusively to the pneumonia.

But 29 per cent. seems a large mortality from primary pneumonia. We have already found in the state of the constitution of a large proportion of the patients one condition favourable to high mortality from disease. Still it is very necessary, with the view of satisfactorily testing the efficacy or otherwise of the treatment followed in these cases, to inquire into the following points:—

1*st.*—The duration of illness before admission.

2*nd.*—The stage of the disease on admission.

3*rd.*—The extent and part of the lung affected.

4*th.*—The length of time under treatment before recovery or death.

5*th.*—The state of the lung on discharge in the cases discharged from hospital.

* In my subsequent statements regarding the rates of mortality, I shall not exclude these cholera cases.

Duration of Illness before Admission.—The subjoined tabular statement* exhibits the duration of illness of the patients before admission.

The mortality of the primary form admitted within five days from the commencement of illness was 5.5 per cent.: the single fatal case admitted in the second stage of the disease occurred in a Parsee of intemperate habits, and was complicated with pleuritic effusion and albuminous urine.

The mortality of the febrile form admitted within five days from the commencement of illness was 25 per cent.: the single fatal case occurred in an individual admitted with fever and bronchitis. Pneumonia came on subsequently, and proved fatal after seventeen days' residence in hospital.

The mortality of primary pneumonia admitted between six and ten days from the commencement of illness was 30 per cent. In 7 of the 8 fatal cases the disease was in the second stage on admission; in 4 the pneumonia was double: 3 of the double pneumonias were in the second stage, 1 in the first stage.

Of the 8 cases of febrile pneumonia, admitted between six and ten days from the commencement of illness, none proved fatal.

The mortality of both forms admitted above ten days from the commencement of illness was nearly 47 per cent.

When we regard all the admissions of primary pneumonia within ten days from the commencement of illness, the rate of

* *Duration of Illness of Patients before Admission.*

	Recovered.		Died.		Total.
	Primary.	Febrile.	Primary.	Febrile.	
1 to 5 days	17	3	1	1	22
6 to 10 „	18	8	8	..	34
11 to 15 „	6	6	4	2	18
16 to 20 „	5	..	1	3	9
21 to 30 „	2	2	2	2	8
31 and upwards	4	..	8	..	12
				Total..	103

mortality is found to be 20 per cent. But when we consider the febrile cases from the same point of view, the mortality is found to be only 8 per cent. Yet for the periods above ten days, the mortality of both forms is the same, 47 per cent.

The lower mortality of the admissions of febrile pneumonia, within ten days from the commencement of illness, is of interest. It seems to show that the pneumonia which complicates malarious fever does not make its appearance till some time after the commencement of the fever. It is, therefore, probable, that in all the cases of febrile pneumonia admitted within ten days from the commencement of illness the pneumonia will be found to be either in the first stage, or not long passed into the second stage.

Stage of the Disease.—Let us now inquire into the stage of the disease at which the admissions took place.

Of the primary form 8 were admitted in the first stage. Of these 2 died: in 1 the pneumonia was double, in the other it was complicated with much bronchitis, and occurred in a man of 60 years of age.

Sixty-four cases of primary pneumonia were admitted in the second stage. Of these 27 were double; 34 were single, and confined to part of a lung; 3 were of an entire lung. If we class together the cases of double pneumonia and those of an entire lung in the second stage, we find that the mortality was 36.6 per cent.; but the mortality of single pneumonia in the second stage, involving only part of a lung, has been 17·6 per cent.

The mortality of the aggregate admissions of primary pneumonia in the second stage has been 26·5 per cent.

Four admissions of primary pneumonia took place in the third stage: all were fatal.

Of the febrile form, 5 cases were admitted in the first stage: 1 proved fatal, admitted after twenty days from the commencement of the fever, complicated with muttering delirium and drowsiness.

Twenty-two of this form were admitted in the second stage. Of these 14 were double, 8 single. The mortality of the former was 35 per cent., of the latter 25 per cent.

Lung affected.—I shall now proceed to state the comparative frequency with which the disease has occurred in the lung of the different sides, and in the different parts of the lung. In this classification, the primary and febrile forms are considered together. Of both lungs (double pneumonia) there were 46 cases, with a mortality of 32·6 per cent.; of the right lung 39 cases, with a mortality of 33·3 per cent.; of the left lung there were 18 cases, with a mortality of 22·2 per cent. Of the cases in which the right lung was affected, the entire organ was involved in 3: this was not the case in any of the instances in which the disease was confined to the left side. Let us, therefore, deduct the 3 cases in which the entire right lung was engaged; this will reduce the mortality for this side to 25·3.

In judging of these rates of mortality, we must always bear in mind that they relate to a series of cases of which the admissions in the first stage are only about 13 per cent.

In this statement the proportion of the cases of double pneumonia is much greater than has usually been observed. This is in part owing to the two forms having been classed together: of the 27 cases of febrile pneumonia, we have the disease double in 17. When we consider the primary form alone, we find of double pneumonia 29; of the right lung 33; of the left lung 14. This is still an unusual proportion of instances of double pneumonia.

When we direct our attention to the part of the lung affected in these cases, it appears that in 79 the lower or middle parts, or both, were engaged, and of these the mortality was 26 per cent.

In 15 cases the upper lobe was affected, and of these the mortality was 26 per cent. In 9 the entire lung, double or single, was affected, and the rate of mortality was 77 per cent.

The greater liability of the lower part of the lung to become affected with pneumonia is well shown in these cases. The great mortality of the disease when an entire lung is involved also appears; but the opinion that pneumonia of the upper part of the lung is more fatal than that of the lower is not confirmed by these cases. It was the opinion of Louis, that individuals above the age of 50 were more liable to pneumonia of the upper

lobe than those of earlier periods of life. Eleven of the 15 cases of upper lobe pneumonia were under the age of 31.

Residence in Hospital.—In considering the duration of residence of the patients in hospital, let us separate the recovered from the fatal cases.

Of recovered cases, 12 primary and 2 febrile were discharged within ten days; 12 primary and 11 febrile between eleven and twenty days; 13 primary and 3 febrile between twenty-one and thirty days; 15 primary and 3 febrile above thirty-one days.

There were 57 cases discharged at different periods above ten days; 18 of them, indeed, above thirty-one days. From this statement we may infer, that though pneumonia in the second stage is frequently recovered from, yet a considerable time is very generally required to ensure the restoration of the lung to its healthy state.

Of the fatal cases, 14 primary and 5 febrile died within ten days from admission; 3 primary and 2 febrile between eleven and twenty days; 2 primary and 1 febrile between twenty-one and thirty days; 5 primary upwards of thirty-one days. The fact of 19 of the 32 fatal cases having proved fatal within ten days of admission shows the advanced stage at which a great proportion of them must have come under treatment. It confirms the direct statement made on this point in a former part of the report.

State of Lung on discharge.—Seventy-one cases were discharged from hospital. Let us enquire into the state in which the lung was at the time of discharge; and in doing so, separate the primary from the febrile form.

Of 51 cases of primary pneumonia the lung was quite* restored in 33, improved in 13, not improved in 5, and in 1 not recorded.

Of 19 febrile cases the lung was restored in 16, improved in 2, and in 1 not recorded.

When we class the two forms together, we find that 62 were admitted in the second stage, and only 9 in the first stage. It has appeared that in 49 of the discharged cases the lung was

* By this I mean that the removal of the dulness on percussion and return of the vesicular respiration indicated that the lung had become permeable, and fit for function.

restored. If we deduct from these the 9 cases admitted in the first stage, we have left out of 62 cases of pneumonia in the second stage 40 recovered, with restoration of the lung. Of the remaining 22 the lung was improved in 15, not improved in 5, and not recorded in 2.

Morbid Anatomy.—There was a post-mortem examination made in 15 of the 24 fatal cases of primary pneumonia, and in 7 of the 8 fatal cases of febrile pneumonia. It is not my intention to enter into any detailed consideration of the morbid appearance observed in these 22 cases. I shall merely notice those points which seem to me to be of interest.

In 11 of the cases the solidified lung was found in a state of induration, either red or grey: this condition, compared with readily lacerable hepatization, occurs in this hospital in a greater proportion even than this series shows. It will be found to be related to asthenic states of the system, to the disease running a slower course, and not unfrequently to advanced period of life. True hepatization, on the other hand, will be found to have occurred in better states of the constitution, and in instances in which the fatal issue has taken place sooner: in the febrile form it exists in greater proportion than induration. Of the 7 cases of febrile pneumonia there was hepatization in 5, and induration in 2; whereas in the 15 cases of primary pneumonia there was induration in 9, and hepatization in 6. The question of whether the grey induration is to be regarded as an advanced stage of the red or brown, or a distinct variety from the commencement, has been discussed at different times. These cases, I think, rather countenance the former view of the pathology of this change. Tubercular deposit was observed in only 1 case—a febrile one: it was in small quantity in the upper lobe of the left lung.

In 3 of the cases—2 primary, and 1 febrile—the hepatization, in places, occurred in nodules: the pneumonia had been in part lobular; but in all there were also hepatized portions of considerable extent. There was no reason for supposing that these cases of lobular pneumonia were dependent on pyœmia. They were more probably instances in which bronchitis had

passed into pneumonia. In all of them increased redness of the bronchial mucous lining was well marked.

Though there are no cases of pyœmic pulmonary abscesses in this series, yet several have been observed in the hospital. Mr. S. Carvalho very lately called the attention of the Grant College Medical Society to this important subject. The interesting paper which he presented detailed the history of the cases of pyœmia which had come under his observation.

Pleuritic adhesions have very generally been found, marking the co-existence of pleuritis, more or less recent. The absence of pleuritis will, I believe, be found to occur more frequently in febrile than in primary pneumonia: of the 7 fatal cases of the former, examined after death, it is distinctly stated that in 2 of them there were no traces of pleuritis, and yet in both there was much red hepatization of the lung.

Thick cacoplastic membranous, almost cartilaginous, deposits were found in 1 or 2 cases, connecting the surfaces of the pulmonary and costal pleura together. One case seemed to show that the deposit takes place in the first instance on the surface of the pulmonary pleura, and advances to some degree of thickness, before it forms adhesion with the opposed costal pleura. In the case referred to, the anterior part of the upper lobe of the right lung adhered to the costal pleura by a thick membranous, almost cartilaginous, layer; while on the same part of the left lung there was an opaque membranous deposit, but no adhesion.

Bronchitis, to greater or less extent, has also been noticed as a frequent complication of these cases of pneumonia. It occurs, I believe, in greater proportion in the febrile form of the disease.

Cavities were found in the lungs in 5* cases. They ranged in size from a small orange to a split pea. In all there were several cavities. They existed both in the upper and lower lobes. They all occurred in the midst of grey induration. In 1 the different stages of the process were well seen: in it, here and

* There was a sixth case, in which cavernous respiration was present, but the body was not examined after death.

there in the grey induration, there were dark red points, from the size of a pin's head to that of a hemp seed; and there were also cavities from the size of a split pea to that of a pigeon's egg, with an inner surface, moist, and of dark-red colour. I believe that in this case, in the grey indurated part, there took place here and there a stasis of blood, probably of the nature of inflammation, followed by molecular loss of vitality, whence softening, liquifaction, and the formation of cavities at these points. This seemed to me to be the process by which in 2 of these cases the cavities had been formed. In the 3 others the appearance of the walls of the cavity, the fœtor of their contents, or of the sputa during life, indicated that the loss of vitality had not been molecular merely, but of portions of the structure more or less large: that the cavities had been formed by a process of gangrene.

In none of these 5 cases in which cavities were found was there anything resembling tubercular deposit observed in the lungs.

We found in many of these cases what may very generally be noted when there is solidification of a considerable part of a lung: I mean a more or less emphysematous or inflated state of those parts of the lung that remain crepitating.

Bright's disease of the kidney was present in only 3 of the cases: in 2 of these there was red hepatization, lobular in character in 1; in the third case there was grey induration, with cavities. On reference to the "Notes on Bright's Disease," published by me in the Society's Transactions, it will be found that pneumonia was present as a secondary affection in only 1 instance. Thus, then, as yet the observations made in this hospital do not show any great relation between pneumonia and Bright's disease: they are, however, not to be looked upon as in any respect conclusive on this point; they have not been made with sufficient care and attention, and frequency.

Nor have my observations in this hospital as yet confirmed the frequent relation between heart disease and pneumonia. Disease of the heart was not present in any of the cases in this series; and pneumonia was found in 2 of the 16 fatal cases of heart disease examined after death, and included in my notes on these affections published in the last number of the Society's Transactions.

In 1 case there had been circumscribed empyema of the right side: perforation of the under part of the middle lobe of the lung at its fissure with the 3rd lobe had taken place. This part of the middle lobe had formed the vault of the sac. The purulent effusion had also opened into the pericardium, and excited pericarditis. In the left lung in this case there was grey induration, and cavities by softening.

The complication of pleuritic effusion, serous or puriform, has been observed in only 2 of the fatal cases. One, just adverted to, was circumscribed empyema and primary pneumonia. The other was febrile: the effusion was of red tinged serum. These results, however, by no means express the frequency with which this complication takes place. It was present in 5 of the recovered cases of this series, 4 primary, and 1 febrile; and I have met with it in several other cases at different times. The defect of vocal thrill, the appearance of a friction murmur as the dulness on percussion lessens, the presence of crepitus at some period or other, and of sputa more or less copious, have been the signs on which the diagnosis of this complication has been determined. On the whole, my impression coincides with that which I believe generally exists relative to the combination of pneumonia, and some degree of pleuritic effusion,—that the prognosis is more favourable in the combined than in the separate affections. We must believe that they commence simultaneously, and may suppose that they mutually influence each other: the solidification of the lung limits the amount of the pleuritic effusion—the pleuritic effusion limits the degree of the solidification of the lung. The advance of the morbid change in both is thus checked, and there is a more ready tendency to a restoration to health.

Symptoms.

I shall consider the symptoms, as they have presented themselves in these cases of pneumonia, under the following heads:—1*st*, Fever; 2*nd*, Pain; 3*rd*, Dyspnœa; 4*th*, Cough; 5*th*, Delirium; 6*th*, the Character of the Sputa; 7*th*, the Physical Signs.

Fever, not hectic in character, was observed in 92 cases—in all of the febrile form, and in 65 of the primary.

The remittent* character of the fever was well marked in all the cases of the febrile form. It was also distinctly observed in a considerable proportion of the cases of pneumonia which have been classed as primary. The remittent character of symptomatic fever is of frequent occurrence, both in the medical and surgical practice of this hospital. To what extent it presents itself as a feature of symptomatic febrile disturbance in the Natives of India generally, I am unable to say. I believe that there is a relation between the frequency of its occurrence and asthenic states of the system. It is of practical importance to watch for it, as I shall explain when we come to the consideration of the treatment of pneumonia. This remittent type of symptomatic fever may be explained on the supposition that the influence of malaria pre-existed in the constitution, and that on the excitement of febrile phenomena from local inflammation, they assumed the remittent form, just as a person previously influenced by malaria may have intermittent fever excited by exposure to cold. The inflammation is the exciting cause of the fever: the state of constitution previously engendered by the influence of malaria determines the type which that fever assumes. This view of the remittent character frequently presented by symptomatic fever will receive confirmation from the observations to be made under the head of treatment. But whatever the true explanation may be, the fact is undoubted, that of the asthenic Natives of Bombay affected with pneumonia, the symptomatic fever is in many instances markedly remittent in type. So much so, indeed, that it is frequently a difficult question of diagnosis to determine whether the particular instance ought to be classed as primary or febrile pneumonia.

In determining this diagnosis, the following considerations have chiefly influenced me, in respect to the febrile form :—

1*st*.—The distinctness of the exacerbation and remission.

2*nd*.—The history, showing clearly that the febrile symptoms had taken precedence by some days of the symptoms of pneumonia.

* I do not think it necesssry to separate the 4 cases in which the fever was intermittent in type.

3*rd*.—The state of the tongue, as regards fur, floridity, dryness.

4*th*.—The presence of much restlessness at night, with some degree of delirium when the pneumonia is not far advanced.

5*th*.—The fever presenting typhoid phenomena. This is, however, an occurrence only of the advanced stages : it was observed in 5 of the cases of this series.

Attention to these circumstances will in general serve for the satisfactory establishment of this diagnosis. Yet, with patients admitted in the advanced stages of disease, with imperfect histories of their previous illness, difficulty will be occasionally experienced.

When the pneumonia has existed for some time in the second stage, then, very generally, the cessation of the febrile phenomena takes precedence for a time—longer or shorter, according to the previous duration of the disease—of the restoration of the lung to its healthy state. The cessation of the fever, when not replaced by that of hectic type, is generally attended by improvement of the other symptoms also, as by lessening of the cough and dyspnœa. It is, however, to the physical signs that we must turn our attention for information regarding the real condition of the lung. In many cases, nearly all of the febrile form, and in a considerable proportion of the primary form, it will be found that the cessation of the fever, and lessening of the cough and dyspnœa, are attended by a corresponding improvement of the physical signs : the dulness becomes less; the bronchial respiration is more distinct, and is gradually replaced by the vesicular; the crepitus redux is sometimes heard; and in a time more or less rapid the signs of complete restoration are present. In other cases of the primary form, however, in which the lung has been for a longer time consolidated, we find that days may pass before the improvement in the general symptoms is followed by signs of the decrease of the consolidation. Then these signs begin to appear, and by a slow process the lung is more or less completely restored. Now it is reasonable to assume, that though in these latter cases the process of restoration is so slow as to require some time before, by a lessening of the signs of consolidation, it gives evidence of its being in progress, yet its commencement

or its tendency to commence, is coincident with the cessation of the fever, and the improvement in the other symptoms. These facts have an important bearing on treatment, as I shall presently endeavour to show.

Hectic Fever was noted in 8 cases : they were all of the primary form. Five of them were the cases in which cavities existed, and which proved fatal. Three of them were discharged cases; 2 with the lung somewhat improved ; 1 with no change.

Pain.—When we inquire into the frequency with which pain in some part of the chest was complained of, we find that it was present in only 40 of the cases : 34 of these were primary, rather more than a half of this form ; 5 were febrile, a little less than a sixth of this form.

The less complaint of pain in the febrile form accords with the results noted under the head morbid anatomy. There it is stated, that pleuritis is more frequently absent in the febrile than in the primary form.

Pain below the Margin of the Right False Ribs was noticed in 13 cases : they were all of the primary form. In 3 there was pain also at the margin of the left ribs. In 6 of the cases in which there was pain below the margin of the right ribs, there was also some degree of abnormal dulness there on percussion.

In only 1 of these 13 cases (a fatal one) was there reason for connecting this pain with the existence of hepatic inflammation. In this single case abscess was found in the liver after death. In my "Notes on Disease of the Heart" it is stated that in 6 of the 21 cases there existed pain and some degree of abnormal dulness at the margin of the right ribs. This was attributed to congestion of the liver, consequent on the obstructed passage of the blood through the heart. That congestion of the liver is apt to occur consequent on obstruction to the passage of the blood through the lungs in extensive pneumonia, is an old observation of pathologists. That it is correct, I believe, from having witnessed a congested state of the liver after death in several cases of pneumonia.

When pain below the margin of the right ribs is present in pneumonia, associated with abnormal dulness, we shall generally

be right in relating it to hepatic congestion. The pneumonia may be either of the right or the left side, but the hepatic congestion indicates, I believe, that it is extensive.

There are, however, other cases in which pain is experienced at the margin of the right ribs, but unattended with abnormal dulness there. In these the pain is probably sympathetic, like that not unfrequently observed at the margin of the left ribs in pericarditis. When the pneumonia is of the right lung, we shall have this kind of pain, if present, at the margin of the right ribs; if the pneumonia be of the left lung, the pain will be at the margin of the left ribs. But we may expect to find it more frequently on the right side, because pneumonia of the right lung is more common than that of the left. This sympathetic pain was noticed in 7 cases of our series: but my remarks are not grounded on these cases alone—the symptom has been noticed by myself and others in other cases in the general wards of the hospital.

The occurrence of hepatitis secondary on pneumonia no doubt occasionally takes place; therefore, when pain is felt at the margin of the right ribs, the fact must be borne in mind. Still, these cases would seem to justify the opinion that the co-existence* of these diseases is not common. It was observed in 1 only of 103 cases of pneumonia, and that in a case in which it was unlikely to occur, for the pneumonia was of the upper part of the left lung. But pain at the margin of the right ribs unconnected with hepatitis has been observed in 12 of the 103 cases.

I have called attention to this symptom† for the same reason that I did so in connection with heart disease—that an error in diagnosis may not be committed, and pneumonia be mistaken for hepatitis. This I have known to occur; therefore I am satisfied that the caution is not uncalled for.

* It must be understood that I speak of hepatitis secondary on pneumonia: pneumonia secondary on hepatitis is more common. I do not now allude to the co-existence of these diseases taking place in this latter order, but only in the former.

† It is hardly necessary to caution against the error of mistaking uneasiness at the margin of the right ribs, with dulness, consequent on displacement of the liver from pleuritic effusion, for the conditions to which reference has been made in these remarks.

Dyspnœa.—We now inquire into the manner in which the function of the lungs has shown itself to be impaired in these cases. Some degree of shortness and hurry of the respiratory acts was noticed in 91 cases: of these 67 were primary, and 24 were febrile; leaving 9 of the first and 3 of the second in which this symptom was not noted.

Though some degree of dyspnœa has been noticed in so many instances, yet in the great proportion of them it was by no means urgent, and in many might have been overlooked, had not the cases, from the circumstance of their being collected together for purposes of clinical instruction, been submitted to careful observation and record. The reason why the dyspnœa was slight, and might readily have escaped notice in many of these cases, is sufficiently explained by the circumstance of the asthenic state of the constitution of so many of the inmates of this hospital.

The degree of dyspnœa present must always be looked upon as an expression of the degree in which there is disproportion between the amount of blood to be aerated, and the extent of the pulmonary aerating surface.

In an individual of sthenic constitution, in whom the blood is abundant, and the full extent of the pulmonary surface is required for its aeration, pneumonia of a small extent of lung is attended with marked dyspnœa; but when the quantity of blood has been for some time reduced, as it always has been in asthenic states, then the full extent of the pulmonary surface is in excess of what is required; part of it may become unfitted for its function by pneumonia, and yet dyspnœa be hardly noticeable. In these statements we have the explanation of the latency or obscurity of the symptoms of impaired function of the lungs in asthenic pneumonia.

When we come to allude to the treatment of the sthenic forms of the disease, we shall find that it is of importance to bear in recollection that dyspnœa is the expression of want of proportion between the quantity of the blood and the aerating surface; and that we may lessen it, or remove it in one of two ways—either by restoring the pulmonary surface to its

structural fitness, or reducing the blood till it is in proportion to the diminished extent of that surface.

In some cursory notes on the thoracic inflammations in the European General Hospital, presented to the Society in May 1845, and published in No. VI. of the "Transactions," the following remarks are made:—"Pneumonia is certainly a disease of infrequent occurrence in Bombay; but it may not be altogether misplaced to remark here, that partial and circumscribed pneumonia is by no means a rare complication of the fevers to which Natives are liable in the cold season in the Deccan, and I believe in Guzerat. If the febrile symptoms persist without intermission for two or three days; if the skin be dry; the tongue not furred to the extent that might be expected, were the digestive organs much deranged; then a careful stethoscopic examination will probably detect the existence of a crepitous rale in some part or other of the chest—most frequently in the neighbourhood of the mammary region; and this may be when there has been no complaint of pain, no cough, and attention has not been called to any difficulty of respiration. In these cases, attentive observation will detect an altered expression of countenance, not amounting to anxiety, but which clearly marks the probable implication of some important organ. The person feels ill, but seems unable to explain to another the nature of his feelings; the body is inclined forwards, the lips are dry and parted, the respiration is somewhat hurried, but often not more so than a general and uncomplicated febrile condition might explain. The stethoscope will resolve the doubt, and the free use of tartar emetic, combined with blood-letting, general or local, and blisters, according to circumstances, will, if the disease has not been allowed to go too far, effect a cure, and prove the accuracy of the diagnosis." These remarks were grounded on what I had seen of the diseases of Natives in former periods of my service in the Deccan, and on the Mahableshwur Hills. My experience since in the Jamsetjee Jejeebhoy Hospital has corrected my error in regard to the infrequency of pneumonia in Bombay; but my chief object in reverting now to what I had previously written is, that I may have the opportunity of observing, that though there

is nothing in my experience since at variance with the general tenor of these remarks on the obscurity and importance of febrile pneumonia, yet we ought not to lay much stress on general symptoms such as those I have detailed. In treating the malarious fevers of the Natives of India, percussion and auscultation of the chest should be invariably practised with daily regularity. It is a practical rule, quite as important in the management of this class of diseases as the search for the signs of pericarditis and endocarditis is in the course of acute rheumatism. He is a careless practitioner who allows himself to be taken by surprise by the discovery of pneumonia in remittent fever, or pericarditis in acute rheumatism.

Cough was present in 98 cases, 72 primary and 26 febrile.

The little urgency of the cough in pneumonia has been very generally noticed by writers on this disease. The opinions which I have ventured to express on the general pathology of pneumonia seem to me to afford a ready explanation of this peculiarity. Cough merely expresses the fact that there exists in the bronchial tubes some obstacle to the free transmission of air to the cells beyond: it is a forcible expiratory act, called into play to remove the cause of the obstruction. It is reasonable to suppose, that if the air cells beyond become unfit for aeration, and the venous blood be no longer sent to them, but, instead, to the healthy adjacent cells,—then any obstruction existing in the tubes leading to the impervious cells is no longer the same evil as when the cells were efficient, and blood was sent to them for aeration: hence there is no longer the same demand for cough to clear them. The solidified lung in pneumonia is in the state just described, and such seems to me the best explanation of the little urgency of the cough in that disease.

Delirium was observed in 11 cases. This symptom, when occurring in primary pneumonia, does so in the advanced stages. It is of very unfavourable import. It was observed in three cases of the primary form: they were all fatal, one with pneumonia of the upper part of the left lung in the third stage, with cavities; the other two were double pneumonia, in the second stage.

The remaining 8 cases of the series in which delirium, generally associated with some degree of drowsiness, was noted, were of the febrile form: in 4 there was recovery; in 4 death. Therefore this symptom, more particularly when occurring early in the disease, and when not attended with typhoid phenomena, is not of the same unfavourable omen in febrile as in primary pneumonia.

The Character of the Sputa.—The rusty adhesive sputa characteristic of pneumonia were noted in only 17 cases—12 primary and 5 febrile; of these 14 were recoveries, and 3 proved fatal. In the other cases the sputa were untinged, mucous, and more or less adhesive; in a few cases none are recorded. In 7 cases red muco-puriform sputa are stated to have been present: they were all of the primary form. Four proved fatal, and in all of them there existed cavities in the lungs; in 2 verified by post-mortem examination; in 2 not examined after death, but the cavities were believed to have been present, in consequence of cavernous respiration having been recognised during life. In 3 the patients were discharged: they were cases in which hectic had been present; in 1 there was no improvement of the lung; in 2 some degree of improvement had taken place. In none of the 3 were cavities suspected to exist.

From these cases, then, and from another to which I shall presently advert, the appearance of this character of sputa does not necessarily indicate the existence of cavities in the lungs.

In my "Notes on Hepatitis," as observed by me in the European General Hospital, presented to the Society in May 1845, and published in No. VI. of the Society's "Transactions," I find the following remark relative to the opening of hepatic abscess into the lung:—"This expectoration of brick-red puriform fluid I am disposed to consider as pathognomonic of abscess in the liver opening into the lungs, because there is not any disease of the lungs in which we can conceive as a result the co-existence of pus intimately intermixed with blood—the one, pus, being the result of an advanced stage of inflammatory action, the other, blood, the result of an early stage of the same action; but when we suppose that the pus comes from the

liver, and the blood from the lung irritated by the foreign body, the co-existence is sufficiently intelligible."

Dr. Budd, in his "Treatise on Diseases of the Liver," published in June 1845, writing of the opening of hepatic abscess into the lung, thus expresses himself:—"When this happens, it is marked by very characteristic symptoms, by a new train of stethoscopic phenomena, which it is perhaps unnecessary to detail, and by the sudden expectoration of a dirty red or brownish puriform matter. The peculiar colour of this matter, which has been already noticed, arises from the pus in its passage through the lung becoming mixed with blood and broken down pulmonary tissue. There is no matter like it expectorated in any disease of the lung itself, and I believe that its appearing is pathognomic of abscess of the liver, or at least of abscess perforating the lung. I observed it in several instances in the Dreadnought, and more than once was led by it to detect an abscess in the liver, of which I had previously no suspicion."*

Here, then, are two observers, remote from each other, unacquainted with each other's researches, making at the same time, and very nearly in the same words, the same observation relative to a symptom of disease; yet both were certainly in error, as regarded the exclusive light in which they viewed the symptom.

The kind of sputa of which I am now writing under the designation of red tinged muco-puriform sputa, observed in states of asthenic pneumonia, is not to be distinguished from that which I formerly considered to be pathognomonic of hepatic abscess having opened into the lung. Confiding in my former observations, I, in more instances than one, committed an error in diagnosis, after my transference from the European to the Native General Hospital brought me for the first time into practical acquaintance with asthenic forms of pneumonia.

The diagnosis, when undue importance is not attached to this character of the sputum, may no doubt in the majority of cases be satisfactorily made out; but yet not in all, as the following cases will serve to illustrate:—

* 1st edition, page 88.

Dhoondee Pelajee, a Hindoo mason, 50 years of age, was after twenty days' illness admitted into hospital, on the 24th January 1846, affected with fever, anxiety, dyspnœa, and pain across the lower and anterior part of the chest. There were bronchitic rales, with crepitus and bronchial respiration in the posterior part of the right side of the chest. The disease was considered to be pneumonia. But on the 26th the pain extended from the right nipple to two inches beyond the margin of the right ribs; and there was dulness on percussion throughout this extent; the sputa were of brick-red colour, and in detached masses. The opinion was then entertained that there was abscess of the liver, which had opened into the lung, and that the pneumonia was secondary. He died on the 30th January. The liver extended an inch beyond the margin of the ribs; it had formed slight adhesions with the diaphragm, was congested with blood, but without abscess or other disease of structure. The right lung adhered to the diaphragm and the ribs by tender adhesions; the lower lobe was in a state of red induration.

Allawoodeen, a Mussulman weaver, 37 years of age, was admitted into the clinical ward on the 27th December 1850. He had been ill four months. He was emaciated; his respiration was short and hurried; there was dulness, with some slight bulging of the lower part of the right side of the chest. There was defectiveness there of vocal thrill, and absence of sound under the stethoscope. There was tenderness below the margin of the right ribs; he had constant troublesome short cough, and expectorated red tinged opaque mucus; he suffered from hectic. The illness had commenced with pain of the right side of chest and margin of the ribs, four months before admission; the cough and expectoration had existed for six weeks. The sputa became muco-puriform, and tinged red. About a month after admission there were signs of a cavity at the lower angle of the right scapula, and dysenteric symptoms came on. He was removed from the hospital in a moribund state.

This case was entered pneumonia in the hospital returns. I have excluded it from the present series, because I am very doubtful

of the accuracy of the diagnosis that was then formed: I believe now that hepatic abscess had opened into the lung.

I would hardly have ventured to engage at such length in what may appear to be a mere correction of an error previously committed by myself; but Dr. Budd has, it seems to me, committed a similar error. His work is extensively known, and deservedly of high authority in diseases of the liver. I have felt, moreover, that the circumstances just detailed have an application beyond their immediate subject: they serve to inculcate the lesson of caution, and to impress upon our minds the liability to error in clinical research.

Physical Signs.—It is unnecessary that I should take up the time of the Society with a subject now so well understood as the physical signs of pneumonia. The statement of the stage of the disease on admission, and the state of the lung on discharge, rests on these signs. On this point I would merely observe, that abnormal dulness on percussion, bronchial respiration, with some degree of crepitus in the adjacent parts, and presence of the vocal thrill, were the signs held to indicate the presence of the second stage; while disappearance of the abnormal dulness, and replacement of the bronchial by vesicular respiration, even though the latter has continued somewhat feebler than on the sound side, have been held to signify that the lung had become restored to functional fitness.

There is one caution which it may be useful to make. The frequency with which enlargement of the spleen is met with, makes it necessary that we should be careful not to mistake the abnormal dulness of the left dorsal region, caused by it, for the dulness of hepatization of the lung.

Treatment.

Venesection was held to be expedient in only 3 of the 103 cases of pneumonia included in this report, and even in these it was adopted to a very limited extent. This fact shows clearly enough the general character of the constitution of the persons affected, and the stage of the disease at which they usually came

under treatment. It is not to be explained on the supposition that I entertain peculiar views in regard to the unsuitableness of general blood-letting in the treatment of inflammatory diseases. I entirely agree with those who think that a pulse above the natural frequency, full and firm, associated with increased heat of skin, and co-existing with inflammation of an important organ, indicates the propriety of general blood-letting. But we, at the same time, cannot impress too firmly on our minds, that these are conditions of the pulse which co-exist only with the early stages of inflammation in individuals of sthenic constitution. Whilst thus, then, expressing my belief in the efficacy of general blood-letting in appropriate circumstances, in the treatment of inflammatory diseases, I am unable to concur in those views which regard it as a remedy *peculiarly* appropriate in pneumonia. The opinion that blood-letting may be carried to a greater extent in pneumonia than in other inflammations, rests, it may be supposed, on the observation of the great relief to the dyspnœa which generally follows the loss of blood; and on the inference that this relief may be received as proof that there has been a corresponding improvement in the inflamed lung. Such an inference, however, is surely erroneous. Dyspnœa, as already explained, depends on a want of just proportion between the quantity of blood in the vascular system, and the extent of the pulmonary aerating surface. In pneumonia the extent of that surface is lessened; more blood is sent to the healthy part of the lung; dyspnœa results. By reducing, by venesection or other means, the amount of blood circulating in the system, we necessarily relieve the dyspnœa. But this may have been effected without any improvement having taken place in the state of the inflamed part. Indeed, it is distinctly stated by Dr. Alison,* as a result of his clinical observation, that auscultation may indicate a continuance, and even extension, of the disease, for a considerable time after the breathing has been effectually relieved by blood-letting. Let us admit, then, that blood-letting in pneumonia may afford relief on two distinct principles, one common to it with other inflammations, the other peculiar to itself,

* Outlines of Pathology, p. 281.

and related to the function of the organ. But it by no means follows that the rules for its use in any respect differ from those which obtain in inflammation generally. Blood-letting, within certain limits, is a valuable therapeutic means in certain states and stages of inflammation. Carry it beyond these limits—use it in other states and stages of inflammations—and it becomes injurious. This is equally true of pneumonia as of other inflammations. When the circumstances, as indicated by state of pulse and skin, and stage of disease, are inappropriate, we may not use blood-letting in pneumonia merely to relieve dyspnœa. This would be a mere palliation of a symptom, purchased by increasing the tendency to death in another way. It would be as if in idiopathic fever, complicated with diarrhœa and stupor, we were to give full opiates, and check the former, with the certainty of increasing the tendency to death by coma.

The statement made, with the view of inculcating free blood-letting, by Andral,* and repeated by Dr. Watson,† that this remedy is useful in pneumonia, on the principle applicable to all inflammations, and also on the principle in accordance with which the exclusion of light is useful in opthalmia, and rest in an inflamed joint, is, I apprehend, in its latter part, of very doubtful accuracy. If the opinions which I have ventured to express in a former part of this paper be at all correct, viz. that after the affected pulmonary cells have, for a time, been the seat of inflammation, they become unfit for function, they no longer exercise it; then blood-letting can do no good to them, by relieving them from function, as the exclusion of light and rest do to the inflamed eye and joint. It does good to the *healthy* cells, by relieving them of that excess of function which they have been required to assume. But the only way in which the loss of blood can be of use to the *affected* cells is by lessening the inflammation, in the way in which other inflammations are lessened by the same means. The benefit thus gained is improved on, not by the *repose* of these cells, but by

* Clinique Medicale, vol. ii., page 378.

† Lectures on the Principles and Practice of Physic, vol. ii., page 91, 3rd edition.

the *resumption of function* on their part setting the blood in their pulmonary capillaries again in motion.

Local Blood-letting.—Though there has been more scope for the use of local than general blood-letting in these cases, yet the application of this means has also been limited in degree: not so much as regards the numbers in whose cases it was had recourse to, as the extent to which it was considered expedient to carry it.

In 21 of the cases cupping was used; in 36, leeches were applied. We have, then, an aggregate of 57 cases in which local blood-letting was practised: of these, 46 recovered.

The total admissions within the fifth day from the commencement of illness were 22. Of these 20 recovered: in all of them local blood-letting formed part of the treatment.

Between the sixth and tenth days there were 34 admissions. Of these, 26 recovered: local blood-letting was used in 18 of them.

But if we confine our attention to primary pneumonia, this latter statement gives too favourable an estimate of the success of treatment; for of the 26 recoveries between the sixth and tenth days, 8 were of febrile pneumonia; and I have already observed, that though the fever was of that duration on admission, the pneumonia was probably of more recent origin.

From this statement, then, we are justified in concluding that when pneumonia is seen within five days, or a little over it, that even in the classes to which the inmates of this hospital belong, local blood-letting to some extent is an appropriate remedy, and, when so, an undoubtedly efficacious one.

Of the 46 recovered cases in which local blood-letting was used, there remain 8 admitted above the tenth day of illness.

Of the 11 fatal cases in which there had been local blood-letting, there were 3 admitted between the sixth and tenth days, and 8 above the tenth day, from the commencement of illness.

It appears, that of 47 cases of pneumonia admitted after the tenth day, local blood-letting was had recourse to in only 16. Of these 47 cases, 25 recovered, and local blood-letting had been used in 8 of them. We find, then, that for pneumonia admitted after the tenth day, the scope for local

blood-letting is very limited; for even in those for whom at the time it seemed admissible, there were as many deaths as recoveries.

The principles which have been observed in directing local blood-letting have simply been the symptoms and signs of pneumonia being present with that condition of pulse and skin which on general therapeutic principles justifies the use of this means.

To those who by clinical experience have yet to become familiar with the varying conditions of the pulse and their indications, it may be said that in the Natives of India generally, we are not likely to meet with the state of pulse and skin which indicates local blood-letting, co-existing with a primary pneumonia of upwards of ten days' duration.

Tartar Emetic.—We have found that in these cases there was little opportunity of practising general blood-letting. There has been also, and for the same reasons, little opportunity of giving tartar emetic in free doses. I am, however, from former experience, perfectly sensible of its efficacy in suitable cases.

This remedy, however, has been used to some extent,* in 66 of our cases: of these, 49 were recoveries, and 17 fatal.

Of the recoveries 33 were admitted under 10 days' illness, and in 24 of these local blood-letting had also been used. Sixteen were admitted above ten days' illness: in 5 of these tartar emetic was given alone, in 11 it was combined with quinine.

We may infer, then, from these statements, that in many of the recovered cases for which local blood-letting was considered appropriate, the moderate use of tartar emetic was held to be so also, and that it assisted the cure; that in some in which local blood-letting was had recourse to, tartar emetic was omitted, either in consequence of co-existing gastro-enteritic irritation, or from the treatment with mercury having been preferred. Further, that in some cases for which local blood-letting was not considered appropriate, tartar emetic was used, generally in combination with quinine, on a principle to be subsequently explained.

* From a sixth to half a grain every second, third, or fourth hour.

The principles which have been applied to local blood-letting, may be also to this moderate use of tartar emetic, viz. that those states of pulse and skin, and symptoms that indicate the propriety of local blood-letting justify the use of tartar emetic, provided it be not contra-indicated by the presence of an irritable state of the gastro-intestinal lining. But we may probably go further than this, and say, that if we are careful to guard against the tartar emetic causing increased evacuations from the bowels, we may use it in instances of pneumonia with febrile disturbance, in which the small volume and compressibility of the pulse are such as to contra-indicate local blood-letting or other evacuations. We may do so because, by this cautious use of tartar emetic, we are not adding directly to the asthenia; and if by its use we can in any respect lessen the degree of febrile disturbance we certainly lessen the influence of a state which tends rapidly to induce asthenia.

Mercury, Calomel, and Opium, were given with the view of inducing mercurial influence in 21 cases. Of these, 20 were of the primary form, and to them the following statements are confined.

Fourteen were recoveries; 6 proved fatal: mercurial influence was induced in 11 of the recovered cases, and in 2 of the fatal ones. In the remaining 7 it was necessary to omit the remedy, from some cause or other adverse to its continuance. The cases in which mercury was used were in the second stage of the disease. In the 14 recovered cases, 7 were admitted within five days from the commencement of illness, 5 between the sixth and tenth days, and 2 after the tenth day.

Of the 11 recovered cases in which mercurial influence was induced, there was in 7 complete restoration of the lung; but in 4 only improvement. Of the 7 restored cases, 4 were admitted within five days, and 3 between the sixth and tenth days. Of the 4 improved cases, 2 were admitted within five days, and 2 above that period.

Let us now take 8 of the cases in which mercury was used, and regard them from another point of view. In 3 the commencement of improvement in the lung was coincident with the

tenderness and swelling of the gums; in 3 the improvement of the lung distinctly took precedence of the usual indications of mercurial influence; in 2 there was no improvement in the lung consequent on the mercurial influence.

Let us now follow the 6 fatal cases in which mercury was given. The 2 in which the mercurial influence was induced had been ill upwards of twenty days before admission: in 1, dysenteric symptoms and hectic fever came on; in the other, after mercurial influence had been evolved, hepatitis ending in abscess took place. Of the 4 other fatal cases in which it was necessary to intermit the mercury, 3 were admitted between the sixth and tenth days, and 1 within five days.

Let us now address ourselves to the question of whether this series of cases is favourable to the mercurial treatment of pneumonia.

Of the 71 cases discharged from hospital, the lung was restored in 49, and improved in 15. Of the restored cases, 7 were brought under the influence of mercury, and 42 were cured without it; and of them 37 had been admitted in the second stage. Of the improved cases, in 11 the improvement was effected without mercury: they were all in the second stage.

It may, however, be objected to this statement, that the febrile cases have been included, while, with one exception, the mercury was only used in the primary form.

Let us exclude, therefore, from the discharged cases admitted in the second stage, those that were of the febrile form; and we have left of restored primary cases 25, with 18 of them cured without mercury; and of improved cases 13, with 9 of them improved without mercury. Further, let us recollect that of the 7 cured cases in which mercurial influence was induced, in 3 the improvement in the lung commenced before the usual evidence of mercurial influence was present: it may, therefore, be argued, that the improvement was independent of the remedy.*

* This argument has been generally used, but I do not admit its force. There is nothing unreasonable in assuming that the mercury may have influence on the blood and the diseased action before it has proceeded to the degree of causing tender and swollen gums.

From a careful consideration of these facts, we must acknowledge that in these cases we find little evidence of the therapeutic value of mercury in the treatment of pneumonia. But because we have little evidence in this report of the advantage of mercurial influence in the treatment of pneumonia, it by no means follows that it is not an expedient and useful means, under some circumstances of the disease. These cases have borne no testimony to the efficacy of general blood-letting, or the free use of tartar emetic, but their utility in suitable cases has not on this account been called in question; nor may we doubt the advantages to be derived from mercury when the circumstances are appropriate for its use. It is most important that we should endeavour to determine what these circumstances of pneumonia are for which the mercurial influence holds out the prospect of good, in order that we may have recourse to it only in these, and abstain from it in those for which it is unsuitable and injurious.

For the treatment of sthenic pneumonia in its first stage, or as it begins to pass into the second, general blood-letting and the free use of tartar emetic are, I apprehend, the appropriate remedies, because we are almost certain under these circumstances of finding present the full and firm pulse, and increased heat of skin, which indicate the propriety of the adoption of these means. But when the disease has gone on, and passed into the second stage, or come under treatment at this period, then, in addition to that degree of local blood-letting and tartar emetic indicated by the state of pulse and skin, we should give calomel and opium in such manner as shall best induce a gentle mercurial influence. But when the failing volume and strength of pulse, and reduction of the temperature of the skin, indicate deficient blood supply, and a feebly acting heart, then, whether this state be consequent on long duration of the disease, or too antiphlogistic treatment in a constitution originally sthenic, or be in co-existence with the earlier stages of the disease in a constitution originally asthenic, we must abstain from the use of mercury. Its influence induced on the system in these conditions of the blood, and this state of action of the heart, will increase the exhaustion: instead of favouring the removal of lymph deposits,

or, if not removeable, their organization, it will favour their degeneration into pus or sero-pus.

If I were asked to state a rule on this point of practice, that might be applied to clinical purposes, I should be disposed to say, that calomel and opium should only be given in the second stage of pneumonia, *in addition* to tartar emetic; and that when the state of pulse and skin are such as to contra-indicate the use of tartar emetic, mercurial influence is equally contra-indicated. In sthenic pneumonia it will be found, I think, that after the tenth or twelth day of the disease, mercury will no longer be appropriate; while for a very large proportion of the asthenic form, it is altogether unsuitable. It not only increases the asthenia, and favours the occurrence of softening or gangrene of the indurated lung, but the calomel and opium are very apt to cause irritation of the intestinal mucous lining, leading to dysentery or diarrhœa. This is a most unfortunate complication of asthenic pneumonia, and ought most carefully to be guarded against. The issue in several of the fatal cases of this series was hurried on by exhausting diarrhœa.

For the treatment of the second stage of the febrile form of pneumonia, mercurial influence is most inexpedient. We have, as I shall presently show, a more powerful agent in the sulphate of quinine. Moreover, I have always had the impression that mercurial influence was likely to be injurious in malarious fever. Twenty-four years' observation and practice in India have changed this impression into a firm conviction.

Blisters.—Blisters have been used in 82 cases; of these 52 recovered. It appears, then, that this remedy has been had recourse to in a greater number of cases than any other of the means which have been noticed. This has occurred, because blisters are more applicable to a greater variety of circumstances, —to the more advanced stages of those cases in which local blood-letting and antimony have been used, as well as to those for which these remedies have been considered inappropriate.

This greater experience of the use of blisters might seem to justify a positive opinion in respect to their therapeutic value; but this is not the case: it is difficult to come to a satisfactory

conclusion on this point. They are used in those more advanced stages of disease in which we cannot look for marked and speedy improvement under the use of any means of cure, and in which we must be satisfied with steady, progressive, though slow amendment. When the stage of pneumonia suitable for the use of local blood-letting has passed, then my impression, on the whole, is, that blisters may be had recourse to with advantage. If used too early in the disease, they are apt to re-excite the febrile disturbance, and to do harm. If used in very asthenic states, they are sometimes followed by troublesome ulceration, and the continued irritation thus arising does harm, by increasing the asthenia. On these points, then, we must be cautious. The blisters used in these cases have never been larger than four inches square. The liquor lyttæ has been the preparation generally selected.

Quinine.—The sulphate of quinine has been given in 56 cases; of these 37 were primary and 19 febrile: of the former 27 were recoveries, of the latter 15.

In the treatment of febrile pneumonia, in addition to such amount of local blood-letting and tartar emetic, and use of blisters, as the symptoms may justify, quinine should be given in adequate doses *during the remission.* It may be combined with tartar emetic. From 5 to 8 grains of quinine, with from $\frac{1}{6}$ to $\frac{1}{4}$ of a grain of tartar emetic, given at intervals of two or three hours for five or six doses, will, in general, suffice to check and then stop the febrile recurrences. When this effect on the febrile symptoms has been produced, it will generally be found that improvement in the pneumonia will at once commence; and in a large majority of cases, if the recurrence of the febrile state be prevented for some days, the inflammation of the lung will be speedily removed.* That this is a therapeutic fact, I am satisfied

* Frequent observation of this therapeutic fact, and a firm conviction of its importance in practice, dictated the confident expression of opinion in the text. During the three months that have elapsed since this paper was written, upwards of 10 cases of pneumonia in the second stage, with febrile symptoms of remittent type, have passed under my observation, chiefly in the clinical ward. This shows that these pathological states are of frequent

from the observation of many cases. The theory of it seems to me so simple that I am almost unwilling to take up the time of the Society by stating it.

There is no pathological fact more undoubted than this, that under the general deranged state of capillary circulation present in the febrile state, there is, after a time, longer or shorter, a tendency to the occurrence of inflammation of some structure or other.

In such circumstances it is a fair inference, that if we remove this febrile state, the general capillary circulation returns to its normal condition, and there must be a tendency, also, in the inflamed capillaries, to return to their healthy state. In the remittent forms of idiopathic fever, we possess in the sulphate of quinine an agent capable of removing the febrile state; and we find, as might have been anticipated, that when this remedy is influential in removing the fever, any local inflammation that may have co-existed with it is also speedily removed.

This principle of treatment has been also applied to many of the cases of primary pneumonia in asthenic subjects.

In my remarks on "Symptoms," I stated that the symptomatic fever of primary pneumonia is not unfrequently distinctly remittent in type, and that it seemed to me reasonable to assume, considering the asthenic condition of many of the inmates of the hospital, that it was so in consequence of the influence of malaria

occurrence in the hospital-frequenting classes of the Natives of Bombay. These cases, presenting themselves so immediately after the statements made in this paper, necessarily commanded my own close attention, and invited that of others interested in the subject. They amply sustained the efficacy of the treatment recommended. Indeed, I am not acquainted with anything more striking and satisfactory in the whole range of rational therapeutics than the progressive but speedy restoration of a hepatized lung, co-existing with fever of remittent type, *when the exacerbations have been controlled by the adequate use of quinine*. It is true that small local detractions of blood, the application of small blisters, and the use of $\frac{1}{4}$ grain doses of tartar emetic, have been had recourse to at the same time; but it is quite impossible for any one familiar with disease, and the action of these means in these degrees, to attribute the benefit chiefly to them, and not to the circumstance of the prevention of the febrile exacerbation by the action of the quinine.

being operative, and determining the character of the febrile phenomena. Influenced by these views, I have latterly, in all cases in which the remission was well marked, given quinine in combination with antimony, in the same manner as in the febrile cases, and very frequently with the same good effect; though I think that the improvement in the lung takes place more slowly. It is also very true, that in some of these cases, in which even the remission is well marked, we meet with disappointment: the quinine fails to control the exacerbation. It must then be omitted, and the other usual remedies appropriate for the case be trusted to.

Liquor Potassæ.—About two years ago, my attention was called to the use of liquor potassæ as a deobstruent remedy in the second stage of pneumonia.* It has been used during the last two years in many cases in the hospital for which mercury was considered unsuitable. It was given in doses of from ʒss to ʒiss every third or fourth hour in 10 of the recovered cases of this series, and, in general, continued for several days. In some the proportion of liquor potassæ was diminished, and from 6 to 10 grains of the sesquicarbonate of ammonia added, when the state of the pulse indicated the propriety of a stimulant. The general impression left on my mind was favourable to the use of the liquor potassæ; but this impression has not been confirmed by a careful consideration of all the hospital cases in which it has been used. I can only find 2, and they are not satisfactory, in which quinine on the principle just explained was not at the same time given. Being already satisfied of the therapeutic value of quinine in appropriate cases, I cannot feel sure of that of the liquor potassæ, when the two remedies have been given at the same time. Further careful clinical observation is therefore necessary to satisfy me in regard to the deobstruent efficacy of liquor potassæ in the second stage of pneumonia. The same may be also said

* I much regret that I am unable to refer to the publication in which the liquor potassæ was recommended. I omitted to make a note at the time, and I have been unsuccessful in my search for it. It was in one of the periodicals. I shall be glad to have the information supplied to me.

of the internal use of iodide of potassium, and the external application of the compound iodine ointment. I have had recourse to both in several cases, but I am unable as yet to offer any opinion in respect to their utility.

Stimulants.—There often comes a time in the treatment of cases of pneumonia, and it may do so very early in the asthenic form, when the failing pulse, the reducing temperature of the skin, and the feeble expectorating efforts, indicate the necessity of stimulants. The earliest tendency to this must be watched for, and stimulants given freely and assiduously. The sesquicarbonate of ammonia, with tincture of squills, wine, and arrack, are the most useful. At the same time chicken soup must be frequently given, and sinapisms or warm turpentine may be applied to the chest. By these means, if adopted in good time, cases that appeared hopeless are occasionally saved, more especially of youthful subjects.

Concluding Remarks.

In our review of these cases we have found that a large proportion of them came under treatment in the second stage of pneumonia, and that when the disease was confined to part of one lung, the rate of mortality of such cases was 17 per cent. I am not acquainted with other data exactly similar with which to compare these results. But the impression on my mind previous to my service in this hospital had always been that pneumonia in the second stage was a more fatal disease.

If, on the whole, success has attended the management of these cases, it is very expedient to endeavour to explain all the principles in accordance with which it has been directed. In a previous part of the report I stated, that in many of the cases a considerable time was required for the restoration of the lung. It has been also stated in another part of the report, that in many cases the cessation of the febrile symptoms, and relief of cough and dyspnœa, are not at once followed by lessening of the signs of consolidation of the lung; that several days may elapse before these begin to appear. The efficacy of local blood-letting, of tartar emetic, occasional mercurial influence

of blisters, and of quinine, has been acknowledged, and an endeavour has been made to explain the principles in accordance with which they have been respectively used. But in these principles we do not find anything that provides for the management of that period in the course of the disease when there is persisting consolidation of the lung, with little or no febrile disturbance, little or no cough, and dyspnœa: yet I am satisfied that it has been on the proper treatment of this condition of the disease that the successful issue of many of these cases has depended. If so, then it is necessary that I should state what the nature of this treatment has been, and the principles on which it has been directed. In the states of the disease to which I now refer, the pulse will be found to be of small volume, and easily compressed. This condition of the pulse, with absence of febrile* disturbance, at once indicates the appropriate method of cure. Antiphlogistics of all kinds, and especially the induction of mercurial influence, should be abstained from, and such degree of tonic regimen and tonic remedies should be used as shall gradually increase the quantity of blood, improve its condition, and the action of the heart: a light nutritious diet, pure air, nitric acid, quinine, and the preparations of iron, are the kind of means to which I allude.

That at different periods in the history of medicine there have been great errors in practice, is a truth which, with a view to future improvement, we are bound to keep steadily before us. Perhaps no better illustration of this truth can be found than the wavering faith in regard to the use of antiphlogistic and tonic means which has characterised the practice of medicine during the last twenty years and more. Those of us who were familiar with practice at the commencement of that period must have witnessed the destructive freedom with which antiphlogistic remedies were not unfrequently used, and must be sensible that there then was a very general blindness in regard to the value of

* I have not thought it necessary to notice those cases in which, with continuance of consolidated lung, we have hectic fever coming on, not cessation of the febrile disturbance. Such cases must be managed on the ordinary principles observed in the treatment of structural disease, and co-existing hectic fever.

tonic means. It was this defect in regular medical practice which has led to its falling into some degree of disrepute, and prompted the establishment of partial systems, as hydropathy and homœopathy, whose tendencies are tonic.

When we turn our attention to the present state of medical practice, I think we may observe that there is a growing tendency to commit the opposite error—to neglect antiphlogistic remedies, and to over-estimate tonics; to lose sight of great leading principles, and to act too much under the guidance of a fragmentary knowledge of animal chemistry.

If this be true, it is peculiarly the province of those who have practised medicine during this period of vacillation and uncertainty, —who have witnessed the advantages of the judicious use, and the evils of the abuse of antiphlogistic and tonic remedies,—to endeavour to hold the balance true between these two leading therapeutic indications, by stating the principles which such varied opportunities of observation may have left impressed upon the mind.

It is considerations of this nature which induce me now to explain, more fully than may seem really required, my reasons for attaching so much importance in certain states of pneumonia to the decided intermission of antiphlogistic, and the substitution of tonic treatment. The principles which I shall state are applicable to all inflammations.

It is inexpedient in a clinical report, in the present state of our knowledge, to attempt to apply the uncertainties of a refined physiology to pathology and therapeutics. It is sufficient for my present purpose that we may confidently believe, that when inflammation of a tissue exists, the leading indication which ought to be kept in view in order to its restoration is the maintenance of a normal state of the capillary circulation in the structures around. It matters not whether the restoration is to consist merely in stagnating blood being again set in motion; or in serous or lymph effusions being absorbed; or in the organization of lymph exudations; or in the degeneration of lymph into pus, with organization of a bounding sac, and processes for the evacuation of the pus, and the after reparation of the abscess; or in the granulation or cicatrization of ulcers. Whichever of these actions must be

gone through before the inflamed structure can be restored to the state of integrity of which it is susceptible, it should be a leading aim in the management of all to bring about and maintain a normal quantity, quality, and rate of movement of the blood in the capillaries around, and in the system generally. If there be symptomatic fever, with a pulse full, firm, and frequent,—the quantity, quality, and rate of movement in the capillary system is abnormal, and our means of correcting it are blood-letting, and other antiphlogistic remedies. But when the pulse becomes soft, and of moderate volume, there will be no more benefit to the inflammation by the continuance of general antiphlogistic treatment: on the contrary, there will be harm,—the pulse will become small and very compressible, states which are indicative of the presence of a quantity, quality, and rate of movement of the blood in the capillaries around the inflamed part, and in the system generally, as adverse to restoration, by whatever processes it is to be effected, as the opposite conditions of symptomatic fever. Under these circumstances of inflammation we cannot hope to do good, unless the tendency of our regimen and remedies be decidedly tonic.

These may seem very narrow principles, yet they are very useful in practice. They may seem trite and simple, yet I suspect that they are often lost sight of under the seductive influence of transcendental theories, inapplicable to practice in the present state of the science. But after all they reach further than may at first sight appear.

In the state of pneumonia to which reference is now being made, mercury is an injurious deobstruent, for it spoils the quality and lessens the quantity of the blood; but it is probable enough that a deobstruent may yet be discovered not having this unfavourable influence on the blood, and therefore applicable to the treatment of this state of consolidation of the lung. Still a tonic influence on the blood and action of the heart must be a leading indication of cure, for unless there be an adequate capillary circulation immediately around the deposits, there can be no absorption under the influence of any deobstruent. Again, the idea that many inflammations are dependent on the presence of a materies morbi in the blood is gaining ground as a pathological

theory: very probably a true one. If so, elimination by the excretory organs must become a distinct indication of cure in the treatment of such inflammations. Still the aim to maintain a normal state of capillary circulation by antiphlogistics or tonics, as the case may be, must always be a leading indication: without it we can have no adequate action of the excretory organs, no sufficient elimination from the blood. It would be easy to increase the illustrations which tend to prove that whatever *special* therapeutic indications may arise in the treatment of particular forms of disease, suggested by physiological or chemical theories, there must always be the over-ruling therapeutic principle of maintaining as far as practicable a normal condition of the blood, and an adequate capillary circulation, general and local. This we must endeavour to effect, in some forms of disease by antiphlogistics, in others by tonics. The state of the pulse, and the general condition of the system, guide us to the use of the one or the other means.

In conclusion, I would observe that the argument might suggest itself to the mind, that what has now been written relative to the importance of attending to tonic treatment in the management of certain stages of inflammation is only of application to the present state of medical practice, and would be altogether unnecessary if every instance of inflammatory disease were submitted to judicious antiphlogistic treatment at its outset. Such an argument, however, would rest on an imperfect knowledge of pathology. There is no question of the fact that instances of pneumonia occur, which, though coming under treatment in the first stage, and judiciously treated, yet pass on to the second, and remain in that state for periods longer or shorter, and then gradually become restored to the healthy state. This is true of other inflammations also. The doctrine of critical days rests on the observed fact of the tendency of many instances of disease to run a certain course before they turn back in the direction of health. The theory is related to the pathological doctrine of the dependence of many forms and instances of inflammatory and other classes of disease on the presence of a materies morbi in the blood. But I must now close this report,—it forms no part of my present subject to engage in these speculations.

NOTE

ON

DRACUNCULUS IN THE ISLAND OF BOMBAY.

BY H. J. CARTER, Esq.,

Assistant Surgeon, Bombay Medical Establishment.

[With a Plate.]

Presented October 8th 1853.

My attention was drawn to this subject on the 8th ultimo, from seeing a little boy about 4 years of age in the hospital of the Central Schools, who was suffering from guinea-worm—a most unusual occurrence in these Schools; and, on inquiry, I found that he had not been admitted more than three months and eight days when the worm made its appearance; that he had come from a house situated close to the School of Industry, about three miles off, on the inner side of the island, near the village of Sewree; and that he was the son of the Serjeant who superintended the Schools.

Upon further inquiry, also, it appeared that the Serjeant's wife had a guinea-worm in her ancle; that a male servant belonging to Dr. Buist, whose house is close by, had one making its appearance at the chin; and that 21 out of 50 boys in the School of Industry had been affected with guinea-worm during the past year. These boys I examined with the Serjeant, and we found that some had had as many as five extracted, and that there were 10 boys then suffering from them, all of whom had been in the School more than a year; none had guinea-worm who had been admitted during the past twelvemonth. In all who had been affected, with the exception of three, the guinea-worms had

come out from the knee downwards; in the three exceptions, one was extracted from the right side opposite the liver, one from the perineal region, and the other from the thigh.

These boys are living in an embanked enclosure about 50 yards square, which has been taken in from the shore, and at high-water is surrounded on three sides by the sea, while the fourth is bordered by a cliff of the mainland about 30 feet high. The soil is decomposing trap, of a clayey consistency, and yellow colour.

In this space there are two wells or pits, each about 10 feet square, one of which supplies water for drinking and culinary purposes, and the other is used for bathing : the former is about 6 feet, and the latter about 3 feet deep. No other water is used by these boys ; but the Serjeant and his family, as well as the other people who reside at the top of the cliff, get their drinking water from deep wells excavated in solid trap rock some way off, while they bathe and wash in water taken from the wells in the embanked enclosure of the School of Industry.

It will be remembered, that at the last meeting of the Society I stated that in examining *Confervæ* from different tanks in the island of Bombay, I had seen minute worms, closely resembling the young of the guinea-worm, and that they happened to be most abundant in *Confervæ* from the tank of Nagaum, which is situated close to Matoonga, where the Artillery were formerly cantoned, and from whence they were obliged to be removed on account of the extreme prevalence of guinea-worm among both soldiers and officers. The houses, mess-room, racket-court and burying-ground, dilapidated and overgrown with vegetation, now mark the locality of this unforeseen occurrence. Guided by these facts, I took some silty *Confervæ* from the pit in which the boys at the School of Industry bathed, and found it also to abound, among other animalcules, with this worm. Every piece of *Confervæ* not larger than a pea contained 20 or 30 of them.

Having ascertained this, and having prepared a dried one on a slip of glass in balsam for reference, I next took specimens of the young of the guinea-worm which had been extracted from the thigh of the Serjeant's little boy, and on comparing the two,

found them, with the exception of a faint corrugated or segmental appearance on each side of the latter, identical in form, colour, and general appearance. But as descriptions and figures of each will be more satisfactory than bare assertions, I will give both, and leave the reader to judge for himself respecting the correctness of what has been stated.

Description of the Young Guinea-worm.

Vermicular; slightly diminishing anteriorly close to the head, which is sub-pointed, not presenting, even under a high magnifying power, the papillæ seen in the full developed animal; posteriorly, beginning to diminish in breadth a little in front of the junction of the middle with the posterior third; tapering from thence to an almost imperceptibly caudal extremity, whip-like, and not inflected at the point, as in the adult animal. Body colourless, whitish, filled with a granular matter that disappears towards the head and tail, which, together with the sides, are thus left transparent; the latter presenting the faint corrugated or segmental appearance mentioned, which also does not exist in the old animal. *Size.*—Length $\frac{1}{3}\frac{1}{3}$ inch; breadth $\frac{1}{0}\frac{1}{3}\frac{1}{3}$ inch. (Plate I. fig. i.)

Description of the Tank-worm.

All the characters of the foregoing, with the exception of the corrugated or segmental appearance at the sides; the head, too, is perhaps a trifle more pointed. *Size.*—Varies, equal to, and less than that of the young guinea-worm. Length of specimen from which the drawing was taken $\frac{1}{3}\frac{1}{4}$ inch; breadth $\frac{1}{1}\frac{1}{0}\frac{1}{0}$ inch. (Fig. 2.)

Habits.—Like the young guinea-worm, this, when fresh, is also very active, twisting and twirling about, seeking shelter or concealment in small pieces of silty *Conferva*, or flocculent matter which may be present, never quiet until it gets inbedded in them, and frequently holding on by its tail, as if the latter were prehensile, or entangled in the mass, by temporary curvature. This character I also subsequently saw in the young guinea-worm, and it is mentioned by Dr. Duncan in the Calcutta Medical and

Physical Journal, vol. vii. p. 273, who observes:—" They swim after the head, but can fix their slender extremity to an opaque substance, and work the body to it." He afterwards adds, as his opinion, " that the young animal can work its way into an appropriate receptacle by its pointed extremity."—Coiling itself up, and writhing spasmodically as the water in which it was sporting continues abundant and fresh, the tank-worm, as the latter evaporates, loses its energy, and perishes altogether as it dries up or becomes putrescent; a few minutes in either state being sufficient to arrest its vitality irretrievably. The same is the case with the young guinea-worm: both have extraordinarily little tenacity to life.

Dr. Forbes, in this Journal, (vol. i. p. 215,) also states, that in the months of August and September 1836, he found an " animalcule" abounding in the fine mud of the tanks about Dharwar, " exactly resembling" the young guinea-worm.

I have also examined the full-grown guinea-worms that were extracted from the Serjeant's little boy and his mother, with three others of the same kind that were taken from people in Bombay, and the result of these examinations, together with drawings of the extremities of this worm, and its internal organs magnified, will be given at the end of this paper.

To further test the probability of this tank-worm and the guinea-worm being one and the same animal, I examined with the miscroscope the silty *Confervæ*, which, in like manner with that of the well at the School of Industry, is the only kind that exists in the tank of the Central Schools, and I could not detect in any portion of it a single worm possessing the characters above mentioned, while *Dracunculus* is so uncommon in the Central Schools, that out of an annual average of 319 children, boys and girls, including 50 admissions, there have not been more than three cases during the last eight years; two of which occurred in children after they had been respectively four and nine years in the Schools, and the third, which is the one mentioned at the beginning of this paper, after three months and eight days. Of these, then, it may be stated, that the latter was contracted before admission, since numerous observations support the view that

the guinea-worm requires a year for its full development; and as the other two children were in the habit of visiting and passing many days at a time with their friends out of the Schools, theirs also may or may not have been then contracted. Evident it is, that these cases bear such a small proportion to the number of children, and the length of time which has been requisite to produce them, compared with those of the School of Industry, that they may almost be considered accidental circumstances.

The tank of the Central Schools is about 30 yards square, and 20 feet deep. It is excavated in solid trap, and not supplied with water from springs, as the wells or pits of the School of Industry, but from the rain which annually falls in the enclosure during the monsoon.

Such are the facts from which I would deduce the following inferences:—

1*st.*—That *Dracunculus* may follow bathing in water containing the tank-worm above described.

2*nd.*—That it is bathing in water in which this worm exists, and not drinking it, that gives *Dracunculus*.

3*rd.*—That the tank-worm may be easily exterminated.

The first inference rests on the extreme prevalence of *Dracunculus* at the School of Industry, where the tank-worm abounds in the bathing-well, and the almost total absence of the former in the Central Schools, where the latter does not appear in the tank, from which the water used by the children both for bathing and for culinary purposes is exclusively supplied.

The second inference is only supported by the occurrence of guinea-worm in the Serjeant's little boy and his mother, who do not drink the water from the wells in the School of Industry, but use it for bathing. To this, however, we may add the occurrence of guinea-worm generally, in the lower extremities, which are more exposed than any other parts of the body to contact with water. Against which, again, the objection commonly raised is, that *Dracunculus* occasionally occurs in all parts of the body; but if, as I shall endeavour to show presently, the gastric juice be probably fatal to its existence in the state that it may be assumed to enter the body, and that the pores of the skin are abundantly large

to admit the tank-worm, then these facts, connected with the power which we know the guinea-worm to possess of piercing the tissues to attain the surface, seem to answer this objection, since the latter would enable the young guinea-worm to pierce its way into one of the blood-vessels, from whence it might be borne off to any part of the body for ultimate development; even to the brain itself, if it were not evident that, for the continuation of the species, the young must be poured forth from the surface of the body.

That the gastric juice is fatal to the existence of the young guinea-worm, would appear, from the result of an experiment stated by Dr. Forbes in the paper to which I have already alluded, in which he gave, in water, the young of the guinea-worm fresh from a Sepoy's leg to two pups, and on examining one four, and the other twenty-four hours afterwards, found the worms "dead in the mucous of the stomach and duodenum"—"not one of them showed the least sign of vitality." Nor, *à priori*, would one think that these delicate worms, both tank and guinea-worm, so easily destroyed by a few seconds' putrescency or want of water, could support the ordeal of the gastric juice before they got into the tissues of the body.

While, on the other hand, when we compare the calibre of the tank-worm with the ducts of the sudorific glands, and remember that many of the former are not so broad as a human blood-globule, while the latter are thirteen or fourteen times the length of the tank-worm, are filled with anything but an acrid secretion, indeed frequently nutritious, and present their open pores in thousands all over the skin,—it does not seem far-fetched to conclude that the guinea-worm, which, for some wise purpose that we do not at present see seeks a temporary location in the human body, should enter it by such convenient channels.

Bearing upon this question would appear to be the time and size at which inpregnation in the guinea-worm takes place, for we know that the sexes are in different individuals. And the very fact of the female coming to the surface of the skin to pour forth her young, seems to point out that they need a state of freedom for impregnation, else why are they not ejected into the tissues, or into some of the cavities of the body. Again, they

must be extremely minute when they are taken into the body, whichever way they enter, and then their impregnation, if it takes place out of the body, must be performed when they are so small that they are almost imperceptible to the human eye.

It seems equally difficult to conceive, that, for impregnation, two individuals of different sexes should enter the body close together; or that animals of such tardy progression, entering the body at different parts, should be able to get to each other for this purpose; or that the body should swarm with males and females for the purpose of developing only, perhaps, one individual for the continuation of the species; as to conceive that the animal enters under any other state than that of maturity.

Is it not more reasonable to infer that it can develope its young in the tanks as well as in the human body, but that it grows much larger in the latter—just as the larva of the bee obtains its extra size and development from the peculiar circumstances under which it is placed by the hive, both as respects locality and food, when the death of the Queen Bee renders a successor necessary; or, that it enters the body like a nest with eggs, to be hatched and nourished there, until the young are able to take care of themselves; its location in, and the juices of, the human body, being absolutely necessary for this purpose.

The crooked state of the tail, too, in the adult animal, seems but to be an enlarged deformity of the whip-like, useful, prehensile organ which it is in the young guinea-worm. And as a parallel of extra development under similar circumstances among the *Entozoa*, we might instance the *Distoma hepaticum* or fluke, which in a minute state exists in myriads in the marshes, but grows to a much greater size after it has become located in the gall-ducts of the sheep's liver.

While on this subject it may not be altogether uninteresting or uninstructive to read the following views of Agassiz on the origin of *Entozoa*, which were communicated, in a letter, to Mr. Dana, and thus published in the American Journal of Science for May 1852:—

"Although for want of time," states this great naturalist,—the greatest, perhaps, of the present day,—"my investigations on

intestinal worms have been limited, I have arrived at an important result. You may remember a paper I read at the meeting at Cambridge [America] in August 1849, in which I showed that the embryo which is hatched from the egg of a *Planaria* is a genuine polygastric animalcule of the genus *Paramœcium*, as now characterized by Ehrenberg. In Steenstrup's work on alternate generations, you find that in the extraordinary succession of alternate generations ending with the production of *Cercaria*, and its metamorphosis into *Distoma*, a link was wanting,—the knowledge of the young hatched from the egg of *Distoma*. The deficiency I can now fill. It is another infusorium, a genuine *Opalina*. With such facts before us, there is no longer any doubt left respecting the character of the Polygastrica; they are the earliest larval condition of worms. And since I have ascertained that the Vorticellæ are true Bryozoa, and botanists claim the Anentera as Algæ, there is not a single type of these microscopic beings left which hereafter can be considered as a class by itself in the animal kingdom. Under whatever name, and whatever circumscription, it has appeared, or may be retained to this day, the *class of Infusoria is now entirely dissolved*, and of Ehrenberg's remarkable investigations, the descriptive details alone can be available in future; the whole systematic arrangement is gone.

"This result has another interesting bearing, for it shows the correctness of Blanchard's views respecting the *Planariæ*—their close relation to the intestinal worms under the name of *Trematoda*. Indeed, they belong to one and the same natural group.

"Is it not remarkable that these two types of the animal kingdom, long considered as the fundamental supporters of the *theory* of spontaneous generation, should have finally been brought into so close connection; and that one of them, the Infusoria, should in the end turn out to be the earliest larval condition of the other; —the intestinal worms being the parents of the Infusoria?"

But, to return to our subject, the third and last inference is the practical one, viz. that of the possibility of exterminating the tank-worm, and with it, the young guinea-worms from the human subject; for as myriads of the latter flow out from the protruded

end of the adult guinea-worm when the latter has been emitted from the body, so the tanks in which people bathe who are the subjects of *Dracunculus* must be expected to swarm with them. This last inference rests on the slight tenacity to life which both these worms in their minute state possess, so that by drying up the tank, cleaning it thoroughly, or even, perhaps, by throwing lime into it, which would not render the water altogether unserviceable, their extermination would, probably, be rendered inevitable.

As preventive means, I would suggest that no one should be allowed to bathe in a tank who is suffering from guinea-worm, and no one should be allowed to bathe in a tank containing the description of worm above given, though he may be allowed to drink the water of that tank, or use it for culinary purposes. It is not at all improbable that the prevalence of guinea-worm at the School of Industry, which has only been in existence for three or four years, arose from a boy having bathed in it who was suffering from *Dracunculus*, and therefore, from what I have stated, that the disease there may be easily eradicated.

Description of the Adult Female Guinea-worm of Bombay.

From the confusion that still exists among the species of *Filaria*, the following description of the guinea-worm of Bombay may not prove altogether unacceptable :—

Size.—Of the five which I have dissected, each was about 2 feet 4 inches in length, and about $\frac{1}{50}$ inch in breadth.

All bore a minute *punctum* in the centre of the anterior extremity, about $\frac{1}{1000}$ inch in diameter, (fig. 9,) and around it *rugæ* in circles, the external of which was $\frac{1}{270}$ inch in diameter. Immediately outside them exist two *papillæ*, one on each side, opposite each other, with a transparent area in the centre of each ; these are rather oval, $\frac{1}{475}$ inch in diameter, with the transparent area about $\frac{1}{1000}$ inch. Besides these, there is a third, much smaller, and therefore very indistinct, which is $\frac{1}{950}$ inch from the outer circle, and equidistant from the *punctum* and the two *papillæ* ; it is $\frac{1}{1000}$ inch in diameter. These papillæ have led to the specific name of *labiata* (Creplin), but this is not Creplin's species, as the internal anatomy will hereafter show.

The posterior extremity (fig. 4) presents the small, atrophied tail, suddenly inflected, consisting of one turn, rigid, and of a gristly hardness. This Blanchard states is the distinguishing character of *Filaria Medinensis*. Gm. (Règne Animal "Intestinaux," p. 53.)

On opening the body, two longitudinal muscular bands, (figs. 1 and 2,) divided from each other by two non-muscular transparent areæ, are seen to extend from one end to the other; the former mark the sides, the latter the dorsal and ventral aspects of the animal. There is also a transverse layer of muscular fibres, (circular ?) which are outside the longitudinal band, and appear to be connected with the integument.

Within the abdominal cavity thus formed, floats the alimentary canal and ovary. (Figs. 1 and 2.)

The alimentary canal, after commencing at the *punctum* (*?*) of the anterior extremity, immediately expands into the æsophagus, (fig. 1, *a*,) which at this point is strongly secured by muscular fibres to the surrounding parts, and after continuing on, of the same size, for 2 inches, attached now only by loose cellular tissue, as suddenly contracts again to the small diameter of the intestine, which, pursuing an irregular course through the abdominal cavity, loosely attached to its parieties, at length reaches the posterior extremity, (fig. 4, *a*,) where, instead of continuing to the end of the curved tail, it appears to pass out laterally through the longitudinal muscular band of that side, to which it is as firmly attached as the æsophagus in its corresponding part is attached to the anterior extremity.

The ovary, in like manner, extends throughout the abdominal cavity, loosely attached to it as the alimentary canal, by cellular membrane. It commences posteriorly, as far back as the exit of the intestine, in a blind, slightly dilated extremity, (fig. 4, *b*,) which continues on for about an inch in the form of a narrow tube, and then suddenly dilates into the ovarian sac, which contains the young, and is about $\frac{1}{24}$ inch in diameter. This continues of the same size on to within $1\frac{1}{2}$ inch of the anterior extremity, where it again suddenly contracts to form the oviduct, which, after three or four fusiform beaded constrictions,

terminates in a blind extremity at the small *papilla (?)*. An ovisac 26 inches in length and $\frac{1}{24}$ inch in diameter, which appears to be about the average size in the adult, or fully developed guinea-worm, should, if filled with young of the dimensions mentioned, contain upwards of half a million.

These parts are so exceedingly minute, viz. the *punctum* and the small *papilla*, that I am not confident which belongs to the æsophagus, and which to the oviduct.

When the animal is sufficiently advanced for exit, the blind extremity of the oviduct passes through the small *papilla (?)* at the head, and bears with it a prolongation, apparently of the outer part of the integument, in the form of a loose corrugated sheath. (Fig. 5, *b*.) I am not certain whether this may not be the anterior part of the worm which has perished, but within this is the oviduct, which makes its appearance at the orifice of the wound in the skin in the form of a dilated vesicle, (*a*,) filled with limpid fluid, which consists of a portion of the contents of the ovary, viz. watery fluid, white flocculent granular matter, and the young guinea-worms.

The posterior extremity of the ovary is filled with little granules like ovules, (fig. 8,) which also seem to be present on the internal membrane of the ovisac throughout ; and towards its anterior extremity, just previous to its constriction, appear in the form of small aggregations, which, when magnified, are found to be groups of granules of a smaller size. (Fig. 7.)

Sometimes the posterior narrowed portion of the ovary is entangled with the intestine, and then assumes the form of a glandular mass, which, however, is nothing but the ovarian tube knotted up, and dilated between the constrictions.

At each extremity of the abdominal cavity, but particularly anteriorly, the muscular bands are covered for about an inch with a layer of sarcoid prolongations of different sizes, which resemble glandular appendages, (figs. 3 and 4, *c c*,) and the posterior extremites of the intervening transparent areæ with a tesselated follicular arrangement. (Fig. 6.)

It will be observed by the form of the ovary, that this species differs from Creplin's *Filaria labiata*, which is figured in the " Règne

Animal" pl. xxiv. from a specimen obtained from the Black Stork, (*Ciconia nigra,*) the ovisac in the latter consisting of five divisions, instead of a simple tube, which divisions unite into a single oviduct some distance from the anterior extremity, where it ultimately terminates.

I have never met with the male of this species. In one instance, where the worm was not broader than a hair, I thought I had found one, but on placing it under a microscope it was found to contain young ones as large as those of the full developed animal.

Vitality.—A guinea-worm of full growth will live several hours after extraction, if kept in a moist state, and the young will live until the parent begins to decompose. The adult guinea-worm is, therefore, much more tenacious of life than the young ones. The head, and half the anterior part of the body of an old animal may have dried up outside the wound for several days, while the other part, with the young, still remains living. This shows that its nutrition and vitality are kept up by imbibition through the surface of the body, while the atrophied appearance of the alimentary canal indicates that it also is very little used, and the shreds on the surface of the integument, that the animal has a direct union with the cellular tissue of the human body.

Explanation of Plate I.

Fig. 1.—Young Guinea-worm from the ovisac of an adult animal, magnified. Scale $\frac{1}{30}$ to $\frac{1}{2}$ inch.

Fig. 2.—Tank-worm, resembling the young Guinea-worm, magnified. Scale the same.

Fig. 3.—Anterior extremity of adult Guinea-worm of Bombay (Filaria Medinensis ?) cut open: *a,* æsophagus *b,* ovisac; *c,* sarcoid prolongations. Magnified.

Fig. 4.—Posterior extremity of ditto: *a,* intestine; *b,* ovary; *c,* sarcoid prolongation. Magnified.

Fig. 5.—Anterior extremity of ditto entire: *a,* anterior extremity of ovary protruded, dilated, and containing young Guinea-worms, &c.; *b,* funnel-shaped sheath. Magnified.

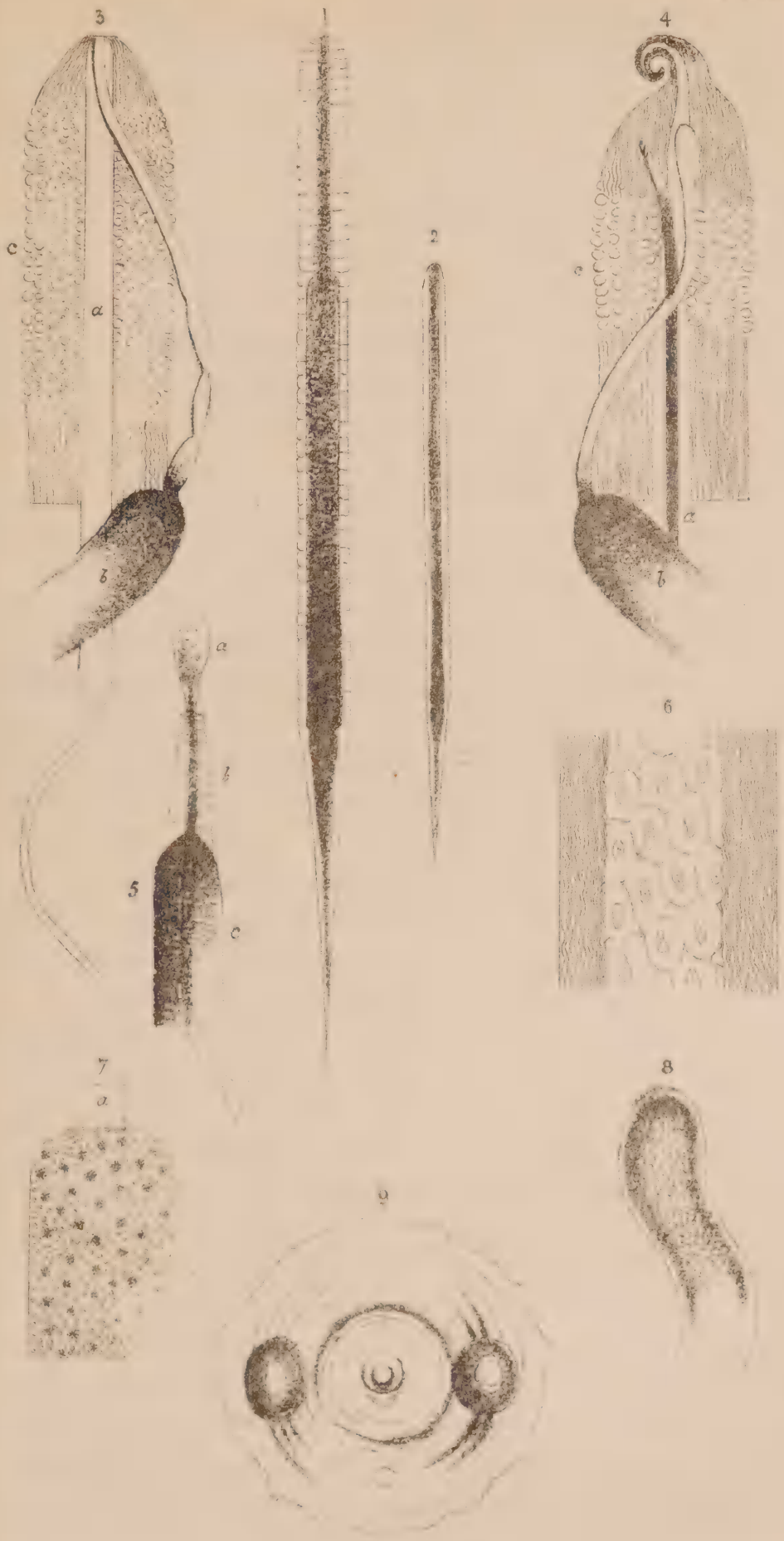
Fig. 6.—Follicular tesselated appearance of posterior extremity of transparent areæ. Magnified.

Fig. 7.—Anterior extremity of ovisac, presenting granular aggregations. Magnified.

Fig. 8.—Posterior end of ovary, filled with granules. Magnified.

Fig. 9.—Anterior extremity, showing *punctum,* circular folds, large *papillæ,* and small *papillæ.* Magnified. Scale $\frac{1}{30}$ to $\frac{1}{2}$ inch.

Pl. I.



H. J. C. del.

F. d. J. lith.

FILARIA MEDINENSIS. (*Bombay*).

ANNUAL REPORT

OF THE

EUROPEAN GENERAL HOSPITAL, FROM APRIL 1ST 1852 TO MARCH 31ST 1853.

BY M. STOVELL, ESQ.

Presented by the Medical Board.

1. AT the close of the official year, on March 31st 1852, there remained 54 patients in hospital. During the past twelve-month 1,039 were admitted, making a total of 1,093 who have been under treatment. Of these 1,004 have been discharged, 43 remained in hospital on the 31st ultimo, and 46 died, being a per-centage of 4·209 on the whole number. The annexed return of the diseases which have been under treatment shows, at a glance, the leading particulars connected with the classes and number of such diseases, and the result of treatment.

2. At the period at which the last report closed, the season was tolerably healthy, and judging from the statistics of this hospital, the past year has been singularly healthy throughout. Not only have the admissions been fewer than usual, but the cases of the more serious forms of disease have been, generally, less severe than for some years past. During the year 1851-52 the number of admissions was 1,142, and the per-centage of deaths 7·256. During the year under review the admissions were only 1,039, and the per-centage of deaths as low as 4·209. It is to be recollected, however, that in 1851-52 there were 16 casualties from cholera, while during the past year there was not one; but making all due allowance for this, the per-centage of deaths is much lower than it has ever been before, during the seven years I have been Surgeon to the hospital. I think, therefore, it may

safely be said that the past year was the most healthy we have had for a very long time. Not only, moreover, has there been no death from cholera, but for the first time since I have been connected with the hospital, a year has passed away without the admission even of a single case, and this fact forms one of the most gratifying features in the history of the hospital which I have to mention. There was at one time a general impression that during a lengthened absence of cholera, other diseases were both more numerous and more severe. The very reverse of this, happily, is shown to have been the case during the period now reported on.

3. During April, the first month of the year, the most prevalent diseases were scurvy, mild cases of fever, and diarrhœa. There were 7 casualties: 1 from fever, 1 from hepatitis, 2 from dysentery, 1 from confluent small-pox, and 2 from delirium tremens. The most prevalent diseases during May were remittent fever, dysentery, and hepatitis, but the number was small, and the cases not severe. There were 4 casualties: 1 from hepatitis, 1 from dysentery, 1 from ebrietas, and 1 from syphilis. The *post-mortem* examination in the last case proved that the immediate cause of death was peritonitis, excited by the presence of an abscess situated between the anterior wall of the lower part of the abdomen and the peritoneum, the abscess having been caused apparently by extension of irritation from a suppurating bubo in the right groin. The most prevalent diseases during June were rheumatism and fever. There were 3 casualties: 1 from dysentery, 1 from diarrhœa, and 1 from paralysis. In the case of dysentery, the patient, a boatswain in the Indian Navy, five months previous to death, passed per anum nearly twenty inches of the mucous lining of some portion of the large intestine. During July the most prevalent diseases, as in the preceding month, were rheumatism and fever. There were 6 casualties: 2 from dysentery, 1 from diarrhœa, 1 from delirium tremens, 1 from scurvy, and 1 from dilatation of the heart with slight ossific deposit in the mitral and tricuspid valves. During August the most prevalent diseases were fever, diarrhœa, and dysentery. There were 6 casualties: 1 from remittent fever, 1

from dysentery, 1 from pleuritis, 1 from abscess connected with disease in the left femur below the small trochanter, 1 from ebrietas, and 1 from a contused lacerated wound on the dorsum of the left foot, the immediate cause of death being tetanus. During September the hospital was unusually healthy the whole month. There were very few cases of severe disease. There were only 2 casualties: 1 from hepatitis, and 1 from dysentery. The former occurred in a pauper of a broken-down constitution, the result of a life of intemperance. The latter occurred in an old pensioner. There was no peculiarity in either case. During October the most prevalent disease was intermittent fever, the most severe cases being admissions from Sinde, complicated with enlargement of the spleen. There was only 1 casualty, and that from dysentery. The *post-mortem* examination showed extensive ulceration in the mucous lining of the colon, and partial sphacelation. During November the most prevalent diseases were fever, dysentery, and diarrhœa. There were 5 casualties: 1 from remittent fever with cerebral complication, occurring in an old pensioner, who was admitted *in extremis*, and died within four hours; 1 from dysentery, 1 from a severe burn terminating in tetanus, and 2 from diarrhœa. Both these cases occurred in children. One was admitted from Sinde, where he had been ill a month; the other died in convulsions. During December the most prevalent disease was fever, evidently caused, in most cases, by an unusual fall of rain during the 5th, 6th, 7th, and 8th of that month. There were 2 casualties: 1 from remittent fever, with cerebral complication, and the other from diarrhœa. During January there was but very little severe disease of any kind. The most prevalent disease was syphilis; then fever, rheumatism, and dysentery. In proof of the exceeding healthiness of the month, I may mention that the admissions were 42 less than in the corresponding month of the previous year, and that only 5 cases of dysentery were admitted instead of 24. There were 2 casualties: 1 from paralysis, in an old drunkard, and 1 from abscess in the liver. This case was treated on board the H. C. steamer *Auckland* from the 2nd January to the 25th, when the man was sent to the hospital, and he died on the 28th. During February, with the exception of a

few cases of dysentery, phthisis, and delirium tremens, there was not much severe disease, and the admissions were 28 less than in the corresponding month of the previous year. There was only 1 casualty, a case of dysentery. The post-mortem examination disclosed extensive ulceration in the mucous lining of the colon, and in one spot a perforation, which accounted for the accession of severe abdominal pain about twenty-four hours previous to death. A portion of the contents of the intestine had escaped into the peritoneal cavity. During March there were a few severe cases of dysentery, variola, and phthisis, but otherwise there was not much acute disease, and the month closed a singularly healthy year. The greatest number of admissions in any one month was 120, in July, and the smallest number 55, in February.

4. I will now proceed to offer such brief remarks on the more important and prevalent diseases as may seem necessary for giving a distinct outline of the medical history of the hospital during the year.

5. *Fever.*—In my last report I mentioned the very unusual fact of the admissions with dysentery having been more numerous than those with fever. During the past year, however, the ordinary state of matters presented itself, the cases of fever being much more numerous than those of dysentery. The number of admissions was 164, or 15·005 per cent. on the total number treated of all diseases. Of these 34 were remittent, 111 intermittent, and 19 ephemeral. There was not a single case of pure continued fever.

6. *Remittent Fever.*—The greatest number of admissions was in May, July, and August, but, excepting in February, one or more cases were admitted every month. There was no distinctly peculiar feature in the general character of the disease, as compared with the remittent fever of former years. In the milder cases there was no appreciable evidence of the existence of local inflammatory action. In the more severe cases, however, there was cerebral, pulmonary, or gastro-enteritic complication, the former being the most frequent. The casualties were 4, or 11·765 per cent. on the cases treated. One of these occurred in

an apprentice of the steam department, who had been under treatment on board ship. He was admitted on April 8th, and died on the fourth day. There was severe cerebral complication. His relations would not permit a *post-mortem* examination. A second case occurred in a pensioned sub-conductor, who, after being ill a fortnight, and under treatment elsewhere, was admitted *in extremis* on November 9 th, and died within four hours. On examination, the meninges of the brain were found much congested, particularly the pia mater, and the arachnoid in several places was opaque and thickened. There was serous effusion to the extent of four or five ounces in the arachnoid cavity, and the sub-arachnoid spaces were distended with effusion. There was also a distinct trace of pus over the base of the lobes of the cerebellum. The thoracic and abdominal viscera were normal, excepting that the liver and mucous lining of the stomach were congested. A third case occurred in a cabin boy of the ship *Ramilies*. He had been ill a week without medical attendance. He was greatly exhausted when admitted on April 21st, and he died comatose within thirty hours. On examination, the meninges of the brain were found much congested; there was serous effusion to great extent in the arachnoid cavity and in the lateral ventricles, and the substance of the brain, when cut into, presented numerous bloody points. The pericardium contained about six ounces of serum; the peritoneal surfaces generally were dusky, and the mucous lining of the alimentary canal slightly congested. The fourth case occurred in a seaman belonging to the ship *Duke of Argyle*. He had been ill nine days without treatment. He was admitted on November 25th, with cerebral complication, and died on the 7th day. The meninges of the brain were found much congested, the arachnoid cavity contained about two ounces of serum, and the brain presented a good many bloody points when cut into. The pericardium contained about three ounces of turbid serum; abdominal viscera normal, with the exception of slight congestion of the peritoneal surfaces. As my treatment of remittent fever doing the year was conducted on the general principles stated in my report for 1850-51, it seems unnecessary to dwell on the subject.

7. *Intermittent Fever.*—111 cases admitted, the admissions being most numerous in July, August, November, and December. There was no casualty. The quotidian type was, as usual, much more frequent than the tertian. The intermissions were generally distinct, and the different stages of each paroxysm well marked. In a few cases, however, complicated with visceral disease, the intermissions were not well defined, the disease showing a tendency to pass into the remittent type. The most severe cases were admitted from Sinde, and in each instance there was considerable enlargement of the spleen. Three conductors in the ordnance department, an assistant apothecary, a serjeant in the engineer department, a man not belonging to any public department, and two women, were thus admitted. They were admitted chiefly in October and November, the type of fever being quotidian in nearly each instance. With the exception of a conductor, who was sent to Europe on sick certificate, they all got well, the spleen in each case subsiding to its normal size. The longest period which elapsed before this normal state was re-established was two months, viz. from October 19th to December 21st. The treatment in every case consisted mainly in the administration of quinine and iron.

8. *Dysentery.*—60 cases have been under treatment, being 5·490 per cent. on the total of all diseases. The admissions were most numerous in July, August, and November, the greatest number in any one month being in August. This is almost invariably the case. In the previous year, however, there was the remarkable exception of the greatest number of admissions being in January. There were 13 casualties, or 21·666 per cent. on the cases treated. Two of these occurred in seamen belonging to the Indian Navy; 1 in a boatswain of the H. C. steam-frigate *Sesostris*; 2 in seamen belonging to merchant ships; 1 in a gunner in the ordnance department; 1 in a corrector of the Byculla Press; 2 in gunners on the pension list; 1 in a pensioned serjeant; 1 in a pensioned corporal; 1 in a pauper; and 1 in a woman. These cases were all in an acute form: those from the Indian Navy had been under treatment on board their respective ships for periods varying from three to eight days. One case

from a merchant ship had been under treatment on board his ship for seven days. One of the pensioners had been under treatment outside for five weeks. The remaining fatal cases had been without previous treatment, and were admitted at different periods, varying from four to nine days from the commencement of the disease. Two cases were admitted in a state of collapse, with a cold clammy surface and a fluttering pulse, and both proved fatal within twenty four-hours.

9. A *post-mortem* examination was made in 9 out of the 13 fatal cases. In each instance there was ulceration, more or less extensive, in the mucous lining of some portion of the colon, and in 2 cases the ulcerative process had extended to perforation, with partial escape of the contents of the colon into the peritoneal cavity. The amount of ulceration varied much in different cases, but in the majority it was very extensive: in some cases the mucous lining of the whole of the large intestines was one mass of disease; from the commencement to the termination there was a succession of ulcers, both circular and transverse, in all stages of ulceration, the outline of each being occasionally clear and distinct, but usually it was quite undefined, in consequence of the coalescing of the different ulcerated surfaces. In several cases portions of the lining membrane were soft, pulpy, and discoloured, and in 4 instances it was in a state of sphacelus. In 6 cases there was considerable thickening of the substance of the large intestines from deposit of fibrine in the sub-mucous cellular tissue. In 3 cases the peritoneal surfaces were congested; in 1 of these the peritoneal cavity contained a few ounces of serum, and in another there was fibrinous effusion on the peritoneal surfaces, agglutinating the convolutions of the intestines. In 1 case there was complete separation and expulsion per anum of the mucous membrane of some portion of the large intestine, about twenty inches in length, the greater part retaining its tubular form. It occurred in the fatal case of Charles Brown, boatswain of the H. C. steam-frigate *Sesostris*. The membrane was passed on January 29th, yet he lived till June 28th, five months. This is the largest portion of membrane which has ever been passed in any case under my care, and the

man lived a much longer time afterwards than I had ever witnessed under corresponding, though less severe, circumstances. With regard to the liver, it was in 6 cases perfectly normal, both in size and structure. In 2 cases it was enlarged, but normal in structure, and in a third it contained an abscess. Thus it will be seen that hepatic complication was only met with in the minority of cases, viz. in 3 out of 9. It seems unnecessary to make any remark on the treatment, as I have so often, in previous reports, stated the principles on which I conduct it, as well as my method of proceeding; and I have seen no reason to change my views.

10. *Hepatitis.*—44 cases have been under treatment; being 4·026 per cent. on the total of all diseases. The admissions were most numerous in June, August, and October. The greatest number in any one month was in August. There were 4 casualties, or 9·090 per cent. on the cases treated. One occurred in a bricklayer belonging to the railway establishment. Previous to admission he had been a month under treatment by the Civil Surgeon at Tanna. He had only been in India a year, and the cause of the disease was clearly traceable to direct exposure to the sun. For four months previous to the attack he had been constantly exposed to it by working daily on the railroad. This is the second death from this cause, within two years, among the small number of Europeans employed in this department. On admission he was much reduced in strength; there was diffused fulness over the right hypochondrium, and hepatic dulness, on percussion, as high as the nipple. An abscess was evidently forming: it subsequently opened into the bronchi, and he died in about four months. The right lobe was found on examination to contain a large abscess, which had been discharging its contents through an opening in the diaphragm into the bronchi. The upper lobe of the right lung was normal, but the middle and lower lobes were infiltrated with a thin sanious fluid, and the base of the latter was adherent to the diaphragm. There was a corresponding and co-extensive adhesion between the diaphragm and upper surface of the liver. A second case occurred in a bombardier on the pension list, who a few months previously

had been invalided in consequence of repeated attacks of hepatitis. There was on admission diffused fulness over the right hypochondrium, dulness on percussion as high as the right nipple, irregular febrile accessions, copious night sweats, and great emaciation. He died three weeks after admission. I had no doubt about the existence of an abscess, but his widow would not permit an examination. A third case occurred in a seaman belonging to the Indian Navy. He had been under treatment on board ship three weeks previous to admission. There was evident fulness in the region of the liver, marked dulness on percussion as high as the nipple, and copious purulent expectoration. He died three days after admission. The right lobe, on examination, was found to contain a large abscess, communicating, through an opening in the diaphragm, with the right lung. The lower lobe of the right lung was partially hepatized, and its base firmly adherent to the diaphragm. The fourth case occurred in a pauper, a notoriously hard drinker, who had previously been repeatedly in hospital from the effects of intemperate habits. He was in a hopeless condition on admission, and he died within forty-four hours. The liver was found normal in size, weighing 5lbs. 8 ozs. ; but it was soft, granular, and of a bright yellow colour throughout. The lining membranes of the stomach and small intestines were somewhat congested.

11. No case occurred during the year in which an hepatic abscess was opened. Four cases occurred in which abscesses opened into the bronchi. 2 of these proved fatal. I have just alluded to them. The other two proved successful. They both occurred in warrant officers of the ordnance department. I have so often stated my views, in former reports, on the treatment of hepatitis, that it seems unnecessary to make any further remarks on the subject.

12. *Delirium Tremens.*—50 cases have been under treatment, or 4·575 per cent. on the total of all diseases, the admissions being most numerous in March. There were 3 casualties, or 6 per cent. on the cases treated. One case occurred in a police constable, who was admitted in an advanced stage, was seized with a succession of convulsive fits, and died within

twelve hours. A second occurred in a sub-conductor in the ordnance department, a notorious hard liver for many years. He was admitted in the first stage, but he rapidly fell into the second, and died on the fourth day in a state of low muttering delirium. The third case occurred in a serjeant in the percussion cap manufactory. He had been drinking hard for a month, and had not had any sleep for several nights. He was admitted in the first stage, but this passed quickly into the second; he then became comatose, and died in this state forty hours after admission. Each of these men was married, and in each instance the widow objected to an examination. Throughout the year I have conducted the treatment on the principles so ably and so fully stated be Dr. Morehead in his paper on the "Treatment and Pathology of Delirium Tremens" in No. VI. of the Transactions of the Medical and Physical Society.

13. *Ebrietas.*—42 cases have been under treatment, or 3·843 per cent. on the total of all diseases. There were 2 casualties, or 4·762 per cent. on the cases treated. One of these occurred in a pauper, who had recently taken his discharge as a seaman from the Indian Navy. He had been drinking hard for many days, and was brought to hospital in a state of insensibility. The stomach pump removed a large quantity of beer and spirits. He died within six hours. On examination, the vessels of the meninges of the brain were found deeply injected, the arachnoid cavity contained about three ounces of serum, the sub-arachnoid spaces were distended with effusion, and the substance of the brain, when cut into, presented a few bloody points. The viscera of the thorax and abdomen were normal. The second case occurred in an engineer in the steam department, who had for many months been leading an intemperate life, drinking habitually two bottles of brandy daily. He had for some days been under the treatment of a private practitioner, by whom he was sent to the hospital. He was admitted in a state of coma, with a cold surface and a fluttering pulse. He died in two hours. On examination, there was found considerable congestion of the meninges of the brain, and serous effusion to great extent in the arachnoid cavity, and in the lateral ventricles. The substance

of the brain, when cut into, presented a few bloody points, and the lining membrane of the stomach and small intestines was much congested. The liver weighed 6 lbs., and was granular and yellow.

14. Having now mentioned the leading facts and pathological features of the more important and prevalent diseases admitted during the year, I will take but a very brief notice of the remainder. *Pleuritis.*—Out of 3 cases admitted, 1 proved fatal. It occurred in a seaman of the Indian Navy. Effusion took place to great extent in the left pleural cavity, and the operation of paracentesis thoracis was performed twice with great temporary relief, but he gradually became exhausted, and died two months from the commencement of the attack. The left pleural sac, which contained about 36 ounces of turbid fluid, was found to be covered throughout its whole extent with a thick coating of lymph, and several large flakes were floating about in the effused fluid. The pleura itself was considerably thickened. The left lung was hepatized, and lying close to the spine. No tubercular disease. Right pleura normal; right lung congested, but otherwise normal; pericardium greatly distended with fluid, but presented no marks of inflammation. The heart was occupying a space to the right of the sternum. *Phthisis Pulmonalis.*—Out of 9 cases 3 proved fatal. One occurred in an engineer in the Indian Navy; the other 2 in seamen, also belonging to the Indian Navy. In each case there was extensive organic disease in the lungs. In 2 cases there were cavities in the left lung, but not in the right, and in the third case there was a cavity in the right lung, but not in the left. *Dilatation of the Heart.*—1 case was admitted and proved fatal. It occurred in a seaman in a merchant ship. The ventricles and auricles were found greatly dilated, the left auricle especially. There was no hypertrophy; on the contrary, there was slight thinning of the ventricular walls. The mitral valve was extensively ossified, both surfaces presenting sharp rough points of ossification. The tricuspid was also diseased, but to less extent. *Diarrhœa.*—83 cases were admitted, and 5 proved fatal. One of these occurred in a gate-keeper in the custom house; a second in a seaman in a merchant ship; and the other 3 in children. No examination was permitted in 4 of these cases.

In the fifth, the one first alluded to, there was congestion in the mucous lining of the stomach, and the liver was in the first stage of cirrhosis. *Paralysis.*—Out of 5 cases admitted, 2 proved fatal. One occurred in a drummer on the pension list, who had long been leading a life of intemperance. The other case occurred in a sail-maker in a merchant ship. *Scorbutus.*—52 cases were admitted, and 1 proved fatal. It occurred in a seaman belonging to a merchant ship. He was admitted in a state of great exhaustion, and could not speak ten words consecutively without inducing dyspnœa. He died the third day. The *post-mortem* examination disclosed nothing of the least interest. The viscera were all normal. *Variola.*—Out of 6 cases which have been under treatment, 3 proved fatal: two occurred in merchant seamen, and the third in a clerk in a public office. One died on the eighth day of the eruption, a second on the ninth, and the third on the tenth. *Syphilis.*—48 cases have been under treatment, and 1 proved fatal. I mentioned the immediate cause of death in paragraph 3. *Ambustio.*—A girl, 11 years of age, while assisting in a cook-room, was severely burnt over the abdomen, thighs, nates, and elbows, in consequence of her clothes catching fire. On the tenth day tetanus supervened, and she died within thirty hours. Her relatives would not allow an examination. *Contusio.*—As one of the officers of a merchant ship was assisting in hoisting a case of machinery out of the hold, the rope gave way, and the block struck him heavily on the left foot, causing a lacerated and contused wound on its dorsum, extending from the tarsal articulation of the fifth metatarsal bone to the extremity of the last phalanx of the same toe. The wound did exceedingly well, but five weeks from the occurrence of the accident, and when the wound was almost completely healed, tetanus supervened, and he died on the third day. The *post-mortem* examination did not disclose anything of the least importance. The spinal cord and its coverings were perfectly normal, and there was no effusion; neither was there effusion or any abnormal condition within the calvarium. *Phlegmon et Abscessus.*—Out of 39 cases 1 proved fatal. It occurred in a seaman belonging to a merchant ship. A large abscess formed in the

upper and outer part of the left thigh, and it was opened with temporary relief, but his health gave way, and he died within six weeks. On examination, the upper fifth of the femur was found denuded of its periosteum, and the bone itself was partially diseased.

15. I have now given a brief account of all the fatal cases. The total number during the year was 46, viz. 4 from fever, 13 from dysentery, 4 from hepatitis, 3 from delirium tremens, 2 from ebrietas, 1 from pleuritis, 3 from phthisis pulmonalis, 1 from dilatation of the heart, 5 from diarrhœa, 2 from paralysis, 1 from scorbutus, 3 from variola, 1 from syphilis, 1 from ambustio, 1 from contusio, and 1 from phlegmon et abscessus.

16. The important subject of morbid anatomy has been constantly kept in veiw, and a *post-mortem* examination has been made in every fatal case in which no objections were raised by relatives or friends. An examination has thus been made in 28 out of the 46 fatal cases.

Bombay, 1*st April* 1854.

Annual Report of Sick in the European General Hospital, from April 1st 1852 to March 31st 1853.

Diseases.		Remained.	Admitted.	Total.	Discharged.	Died.	Remaining.
Fevers	Febris Ephemera	0	19	19	18	0	1
	„ Intermittens Tertiana	0	28	28	27	0	1
	„ „ Quotidiana	1	83	84	82	0	2
	„ Remittens	0	34	34	30	4	0
Eruptive Fevers.	Variola	1	5	6	3	3	0
	Rubeola	0	4	4	4	0	0
Diseases of the Lungs.	Bronchitis Acuta	2	11	13	13	0	0
	„ Chronica	1	7	8	8	0	0
	Pleuritis	0	3	3	2	1	0
	Hœmoptysis	0	2	2	2	0	0
	Catarrhus Acutus	0	7	7	7	0	0
	Phthisis Pulmonalis	0	9	9	5	3	1
	Asthma	0	7	7	7	0	0
Diseases of the Liver.	Hepatitis Acuta	4	30	34	30	4	0
	„ Chronica	2	8	10	10	0	0
	Icterus	0	1	1	1	0	0
Diseases of the Stomach and Bowels.	Peritonitis	0	1	1	1	0	0
	Dysenteria Acuta	5	48	53	37	13	3
	„ Chronica	1	6	7	6	0	1
	Dyspepsia	1	13	14	14	0	0
	Colica	0	14	14	13	0	1
	Diarrhœa	4	83	87	80	5	2
	Obstipatio	0	25	25	25	0	0
Diseases of the Brain.	Cephalalgia	0	16	16	16	0	0
	Paralysis	2	5	7	5	2	0
	Mania	0	3	3	3	0	0
	Delirium Tremens	0	50	50	44	3	3
	Epilepsia	0	1	1	1	0	0
Dropsies	Anasarca	0	3	3	2	0	1
Rheumatic Affections.	Rheumatismus Acutus	1	36	37	36	0	1
	„ Chronicus	1	27	28	26	0	2

Diseases.		Remained.	Admitted.	Total.	Discharged.	Died.	Remaining.
Venereal Affections and Diseases of the Genital Organs.	Syphilis Primitiva	3	28	31	26	1	4
	„ Consecutiva	3	14	17	12	0	5
	Bubo Simplex	0	10	10	10	0	0
	Gonorrhœa	3	25	28	27	0	1
	Orchitis	2	17	19	18	0	1
	Strictura Urethræ	2	8	10	10	0	0
	Phymosis	0	3	3	3	0	0
Abscesses and Ulcers.	Phlegmon et Abscessus	3	36	39	37	1	1
	Ulcus	3	19	22	21	0	1
	Fistula in Ano	1	0	1	1	0	0
Wounds and Injuries.	Luxatio	1	1	2	2	0	0
	Subluxatio	0	18	18	17	0	1
	Vulnus Incisum	0	6	6	6	0	0
	Contusio	1	46	47	44	1	2
	Ambustio	0	3	3	2	1	0
	Fractura	2	13	15	13	0	2
	Concussio Cerebri	0	2	2	2	0	0
Diseases of the Eye.	Ophthalmia	0	22	22	21	0	1
	Amaurosis	0	4	4	4	0	0
	Nyctalopia	0	1	1	1	0	0
Diseases of the Skin.	Urticaria	0	2	2	2	0	0
	Ecthyma	0	2	2	2	0	0
	Porrigo	0	1	1	1	0	0
	Scabies	0	7	7	7	0	0
	Lepra Tuberculosa	0	1	1	1	0	0
Other Diseases.	Amputatio	0	1	1	1	0	0
	Aneurisma	0	3	3	3	0	0
	Cynanche Parotidea	0	2	2	2	0	0
	„ Tonsillaris	0	2	2	2	0	0
	Dracunculus	1	16	17	16	0	1
	Hæmorrhois	0	8	8	8	0	0
	Hernia	0	1	1	1	0	0
	Hypochondriasis	0	3	3	3	0	0
	Neuralgia	0	10	10	10	0	0
	Otitis	0	7	7	7	0	0
	Scorbutus	1	52	53	49	1	3
	Scrofula	0	2	2	2	0	0
	Splenitis	0	4	4	3	0	1

Diseases.		Remained.	Admitted.	Total.	Discharged.	Died.	Remaining.
Other Diseases...	Varix	0	2	2	2	0	0
	Vermes	0	2	2	2	0	0
	Dilatation of the Heart	0	1	1	0	1	0
	Ebrietas	2	40	42	40	2	0
	Leucorrhæa	0	1	1	1	0	0
	Parturitio	0	4	4	4	0	0
	Total ..	54	1039	1093	1004	46	43

ANNUAL REPORT

OF THE

CIVIL SURGEON OF AHMEDNUGGUR, FOR THE YEAR ENDING 31ST MARCH 1853.

BY D. WYLLIE, M.D.

Presented by the Medical Board.

The civil medical duties at Ahmednuggur comprise a Civil Hospital and Dispensary, and the Jail Hospital and Hospital of the Police Corps. Following this order, I purpose briefly to recount the medical history of each charge for the year, limiting my remarks to such points as may possess the claim of interest or require elucidation.

Civil Hospital.

The patients frequenting this institution are in the majority of instances wayfarers, who either voluntarily claim admission, or, as occasionally occurs, are sent to hospital by the local authorities. In the latter instance the cases are often of a hopeless character, exhibiting disease in its last stages, and comprising such patients as superadded destitution may have forced to seek a shelter in the streets. Comparatively few of the town's people come to hospital: they prefer dispensary relief. This feeling extends among the poorer classes, and hence the cases admitted from this source are generally such as are formidable in nature, or rendered inveterate by long continued neglect. A third class of patients have been forwarded from the districts. These, however, form but a small section of the admissions, and have been restricted, during the year, exclusively to cases of mania, and parties who have been injured in assaults, and other acts of criminal violence.

From the character of the cases it will be inferred that the mortality has been high. Thus the proportion of deaths to treated amounts to 8·09 per cent. The number of fatal cases, however, while smaller than for past years, must not be considered as decisive of success or the reverse in practice that not unfrequently begins when life is ending. It is the general results alone that ought to be regarded. These have been satisfactory beyond anticipation, and many whose condition appeared at first sight irremediable, or only offered a prospect of temporary relief, have been restored to health. When the prevailing destitution and wandering habits of the patients are remembered, it will be understood that much of this success is fairly due to the domestic comforts afforded by an hospital; to the influence of adequate food, clothing, shelter, and rest, as contrasted with a life of hardship and privation.

Years.	Total treated.	Ratio of Deaths per cent. to treated.
1849–50.	280	13·57
1850–51.	203	8·86
1851–52.	147	12·92
1852–53.	173	8·09

The number of patients as shown in the table has materially diminished since 1849, when the dispensary was first opened. During the past year the total treated have been 173, of whom 151 were discharged, 14 have died, and 8 remain at this date. Of those discharged a large proportion were cured; others have voluntarily left hospital after experiencing relief, and a few in whose cases change of air appeared advisable, were forwarded to the sea coast. The average daily number of sick has been 16·93, and the average duration of each case 35·66 days.

Fevers have not been numerous: only 28 cases were treated, and of these 11 were remittent. A low typhoid type of attack, and a constant tendency to visceral and membranous inflammation, more particularly affecting the respiratory organs, have rendered this form of fever unusually severe. These complications occurred without reference to season, and their frequency appeared due to the depressing influences to which the patients had been previously exposed. Stimulants were generally required from the period of admission, while the degree of exhaustion was occasionally so marked as to contra-indicate local bleeding

for the relief of inflammatory symptoms. Calomel and antimony were the chief remedies used in controlling the paroxysm, and as soon as the remission occurred, quinine was given, either alone or combined with mercury, as the symptoms rendered expedient. Three cases of the 11 proved fatal, death in each instance being preceded by coma. The cases of intermittent and continued fever presented nothing requiring notice. Some disappeared under the influence of rest and attention to the secretions, and the majority required nothing more than the exhibition of quinine, and an occasional alterative dose of calomel.

There were 5 admissions from *Dysentery*, and 3 proved fatal. These were cases in which the disease had been neglected for many days, and where, from the amount of exhaustion, it was found impossible to bring the system fairly under the influence of remedial agents. One was moribund on admission; another sunk on the fourth day; and the third patient, in whose case considerable benefit had resulted, suddenly relapsed and died, after being fully a fortnight in hospital. In all ulceration of the intestines, especially of the colon, was found on examination, and in the last mentioned case abscess of the liver co-existed.

12 cases of *Insanity* have been treated, of which 11 were discharged, and 1 remains in hospital. Of those discharged 6 were cured and set at large; while 5 afflicted with dementia, in whose cases there was no prospect of affording relief, were sent to the Poona Asylum. The treatment of maniacs, for obvious reasons, cannot be advantageously conducted in an hospital offering no separate accommodation for their reception. Thus the remedial measures adopted have been exclusively medical, and limited to the exhibition of cathartics, cold effusions, and counter-irritation by blisters. In no instance could any history of these cases be obtained. The patients were strangers in the villages from which they were sent, and were supposed to have been passed from the neighbouring territory of the Nizam.

Syphilis in its consecutive form.—A disease of all others aggravated by destitution and neglect has been met with in its most severe and least remediable varieties—ulceration of the bones and soft parts, nodes, and thickening of the structures of particular

joints. There have been 11 admissions, all during the rainy and cold months. In every case relief has resulted, and in some apparent cure. The well-known difficulty, however, of eradicating this form of disease, and its tendency to be latent for a time till the influences of season or exposure re-excite its development, would lead to the inference that in the cases under consideration the relief obtained will only prove temporary. The principal remedies employed in the treatment were mercury in various forms, iodide of potassium, with sarsaparilla, and morphia as adjuvants, mineral acids and iodide of iron during convalescence. As a local remedy in relieving deep-seated pain, none has been so generally useful as mercurial fumigation.

21 cases of *Ulcer* have been treated, the irritable and callous varieties being those most frequently met with. Their usual position was on the lower extremities, and almost all were of very long standing. In their treatment constitutional remedies have generally been indicated, not only by length of duration, but from obvious effects on the general health, as manifested in the appearance, and often in the sensations of the patient. The local remedies have necessarily been manifold, varying with the character of the ulcer; the results, however, have been far from uniform. Thus some have healed under the simplest appliances; others, after resisting many local and constitutional remedies, have cicatrized under the influences of season, while in a few it has been found necessary to try change of air. In the progress of old ulcers relapses have been frequent, and there has been no more common occurrence than to find the remedy employed losing its effects after a brief period; the ulcer that had been healing under its influence becoming suddenly foul, and extending. These changes have not appeared to be connected with atmospheric causes, nor were they traceable to any observable constitutional disturbance.

Under *Carditis* there have been 4 admissions, 3 of which have terminated fatally. In the first case, death resulted from hypertrophy; in the second, this condition co-existed with dilatation, and the third case, which was veiwed as one of pericarditis, proved to be an instance of fibro-fatty degeneration of the heart, with

great thickening of the pericardium, which was, without doubt, the primary seat of disease. The condition of these patients was hopeless from the period of admission, and the treatment attempted was necessarily only palliative. The same general symptoms were present in all: restless nights, the sleep broken by wild dreams, and cramps in the legs, were complained of, and there existed anasarca, and dyspnœa to a degree characteristic of the closing stages of the disease.

The surgical cases in which operation has been resorted to in the Civil Hospital are only 4, viz. 1 of lithotomy, and the others excision of tumours. In the majority of such cases patients have preferred attending at the dispensary, in the returns of which they have been included. All the operations, as far as is known, have been perfectly successful.

Dispensary.

This institution has now been in existence for a period of four years, during which the number attending have been slowly, but progressively, increasing. The patients comprise all classes of the native community, and not a few from distant villages. It offers a mode of relief well suited to overcome native prejudices, bringing with it nothing of the contamination which certain castes would experience from a residence in hospital.

Years.	Total treated.	Ratio per cent. to Strength.			
		Cured.	Relieved.	Absented.	Died.
1849-50.	619	69·95	6·30	20·35	1·13
1850-51.	762	61·67	·26	31·88	1·31
1851-52.	1,144	76.74	4·80	16·26	1.13
1852-53.	1,333	59·86	6·07	31·57	·45

With the assistance it affords, available at all hours, it may be deemed matter of surprise that the advantages offered are not more sought after than the returns show. The fact, however, that many of the patients only apply for relief after prolonged illness, or as a last resource, indicates that time, equally with attention, is necessary to its due appreciation. In this view, the increase, although small in the numbers attending during the past year, must be regarded as encouraging.

The average daily number of patients has been 28·03. The

attendance, however, has varied much during the different months, and while proportionately small in autumn, has been greatest during February, March, and April. The average duration of each case has been only 7·73 days. The shortness of the term is owing to the fact that many of the cases were of a trifling character, as well as to the large number absented, not a few of whom ceased to attend after a single visit.

The total treated for the year amounts to 1,333, of whom 1,292 have been discharged, 6 have died, and 25 remain at this date. Of those discharged, 798 were cured, 81 relieved, and 422 absented themselves.

Fevers, affections of the stomach and bowels, and skin diseases, have been the forms of complaint most commonly met with. From the first mentioned there were 242 cases. Few of these, comparatively, had any characters of severity, and when such have occurred, the opportunities of observation have necessarily been limited, or the patient has been lost sight of for a time. There were 4 deaths from fevers, 2 from the intermittent form, and 2 from remittent.

Affections of the stomach and bowels have constituted an important feature in the admissions. 174 cases have been treated, and a large proportion of the patients were children. While many of these cases have been trivial, others proved tedious and embarrassing, more particularly those of marasmus and tabes mesenterica, as met with in infancy. These diseases have been of ordinary occurrence, and in nearly every instance have happened in children in whom lactation had been unduly prolonged. This prolonging of the maternal function is prevalent both among the Hindoo and Mussulman portions of the population, even after the child may have attained the age of three or four years. The habit appears to be a fruitful cause of derangement of the digestive organs, and more particularly to induce irritability of bowels, with watery, chalk-coloured evacuations; should suckling be persisted in, and the symptoms continue, marasmus speedily follows, and where a scrofulous taint exists, tabes would certainly be developed. Whether the cases witnessed have originated precisely in this way may be open to doubt. The co-existence, however, of the

conditions, and the fact that weaning with no further medical treatment than attention to the secretions has been attended with success, tend to strengthen the view.

237 cases of cutaneous disease were treated; the prevailing forms being scabies, porrigo, and psoriasis. A great majority occurred during the cold months—a period of the year invariably productive of such complaints among the native poor. The progress of these cases has presented nothing to notice, nor does the subject of treatment need further remark than that by far the greater number got well simply by local applications. In some, however, constitutional remedies became necessary, and a few, resisting both methods of cure, only disappeared on the return of hot weather.

Criminal Jail.

The jail stands in the centre of the town, occupying an area of 10,700 square yards. It is intersected by several high walls, and thus divided into distinct compartments, each of which has its separate building for the lodgment of prisoners, and an adjoining open space or court yard. In every division there is an abundant supply of excellent water, and cleanliness is scrupulously maintained throughout.

The site, however, for many reasons, must be deemed unfortunate, not the least of which is that it has necessarily tended to confine the accommodation. Thus several of the yards are only a few feet in breadth, an amount of space much too limited for the purposes of healthful exercise, and, when hemmed in by lofty walls, inadequate for the maintenance of wholesome ventilation. The buildings, also, in which the prisoners are lodged, are by no means well suited for the purpose. The best consist of an old musjeed, and some of its offices. The modern accommodations appear to have been constructed without due attention to the subject of ventilation; and the lowness of the roof in some affords only 276 cubic feet of air for each inmate, while in the latest additions, consisting of two separate rooms, the principle has been still further departed from, both being built in angles of the prison wall, the dead face of which thus forms two sides of each apartment.

The averge daily number of prisoners during the past year has been 343, viz. 315 males and 28 females. Of the former an average of 69 were employed at out-door labour, and 139 at various trades within doors; the remainder were undergoing sentence of simple imprisonment.

The dormitories are unlocked at half-past 5, and the prisoners breakfast at 7. At 8 o'clock work begins, and continues till 4 P. M., after which the evening meal is served, and they are locked up for the night at 6 P. M.

The construction of the jail admits of classification, to a certain extent, and prisoners are lodged together according to the nature of their crimes or length of sentence. All, however, are permitted to mingle indiscriminately during the day, but no one is allowed to go to out-door labour whose punishment may exceed 4 years, not at least while the remainder of his sentence may exceed that term.

This rule certainly presses injuriously on the health of the individuals it affects. Throughout the year atrophy and scurvy, with numerous instances of debility, were alike traceable to its influence; and my predecessor in these duties, entertaining a similar opinion, made it the subject of repeated representation, with a view to such prisoners being employed at out work. An insufficiency of guards was the only tangible reason assigned for not acceding to his recommendation. This difficulty, however, might, I think, be disposed of, by taking the prisoners out in turns, or simply relaxing the existing restriction so far as to admit of those undergoing lengthened sentences having the benefits of fresh air occasionally. I feel satisfied that either plan would be attended with advantages in a sanitary point of view, and be a means of checking a frequent tendency to cachexia, arising from prolonged confinement—a tendency which neither a liberal nor varied dietary, nor any degree of perfection in details of internal management, can otherwise, I apprehend, prevent occuring in this jail.

The admissions for the year are rather under average, and the deaths comparatively few. The absence of cholera, or other epidemic among the diseases treated would account for this,

Years.	Average Yearly Strength.	Yearly Ratio per cent. to Strength.	
		Admitted.	Died.
1849–50.	365	124.65	4.93
1850–51.	356	122.75	7.30
1851–52.	369	84.82	5.69
1852–53.	343	65.62	2.91

but it is also partly due to the fact of several sick prisoners having been released by order of the Sudder Court, on my representation that fresh air offered the only likelihood of preserving life.

17 patients remained in hospital on April 1st 1852; the number admitted during the year has been 328, making the total treated 345. Of these 325 have been discharged, 10 have died, and 10 remain. Regarding period of confinement as bearing on sickness, the admissions are proportionately greatest in those who have been in prison from ten to fifteen years, in whose case it is as high as 185·55 per cent., next in those confined from three to six months, in whom the ratio is 159·37, and least in the instance of those confined above fifteen years, who give a per-centage of only 25.

Fevers have been common throughout the year; the largest numbers occurring in July and August, the smallest in October, November, and December. The total admitted was 125, being a proportion of 38·10 per cent. on the whole admissions. There has been little to remark in any of the cases, for they have varied in no essential point from the ordinary observed forms of the attack, unless in the great degree of consecutive weakness that has resulted. While convalescence has thus been tedious and protracted, even in ordinary cases, those of a more severe character have been followed by anasarca, derangement of the assimilative functions, and atrophy. These conditions, in many instances at least, are solely referable to the deteriorating effects of confinement; they have not, therefore, happened exclusively as a sequence of fever, but have been met with as an ordinary result of visceral inflammation, more particularly where previous habits, or the existence of constitutional debility, have predisposed to their development.

Of 7 cases of remittent fever that occurred during the year, 2 died from exhaustion ere the febrile symptoms had been fairly

subdued; a third, sinking from consecutive cachexia, was opportunely released, as the only chance remaining of saving life. This type of fever has not been marked by any features of urgency, such as are generally witnessed where the attack has followed undue exposure. Local pain or irritability of stomach have seldom existed, and the febrile heat has been little observable on the extremities. Rapidly increasing exhaustion, as evidenced in the pulse, and the sudden appearance of pulmonary inflammation, not unfrequently masked until characteristic expectoration announced its presence, have rendered the treatment of these cases far more satisfactory.

The treatment of fever has varied in no material point from that ordinarily adopted. In the remittent form calomel has been chiefly relied on in bringing about the remission, but the remedy, although successfully employed in mitigating the paroxysm, seemed less effectual than usual in preventing its recurrence. The low type of fever often marking existing inflammation might explain this, but it appears more probable that it was connected with unusual susceptibility to the sialagogue effects of the drug, an occurrence generally remarked in those debilitated by confinement. Of 92 cases of intermittent treated, 1 death resulted from exhaustion, consequent on repeated attacks. This form of fever as witnessed was by no means severe, and on no occasion have the usual remedies failed to control it. There has, however, been a great tendency to relapse, especially in the debilitated, and convalescence has thus been tedious.

Dysentery has been readily amenable to treatment, from the fact that the cases have come under notice at the very outset of the symptoms. Consecutive debility, and the cachectic condition that has occasionally resulted, have alone proved formidable, and from that 2 out of 20 cases treated terminated fatally. The treatment has not varied from what I have on a former occasion detailed, save that sulphuric acid has been used, and although its effects in the acute stages were not sufficiently decisive to give it a preference over more tried remedies, still its employment during convalescence has been attended with marked success, and under

no mode of treatment have the secretions been so speedily restored, or strength regained.

There were 9 cases of diarrhœa treated, and 2 of the number died. Scarcely one of these is to be regarded as idiopathic, but rather as the result of a cachectic condition, arising from confinement, the first effects of which were manifested by loss of appetite, a harsh dry skin, declining strength, and gradual emaciation. A deranged state of the bowels, the stools pale-coloured, and of unusual bulk, generally accompanied these symptoms, and preceded the diarrhœa. Among many remedies that were used to check the primary condition, or control the subsequent purging, none have been followed by so much benefit as sulphuric acid. It has been used in its simple dilute form, in doses of m. xx. to ʒss, with water, and repeated at intervals of two or three hours, according to the urgency of the symptoms. Its effects in checking diarrhœa have not been more remarkable than the advantages that have resulted from its employment during subsequent convalescence; and when tonics and alteratives had alike failed to restore healthy secretion, or arrest increasing debility, this remedy has been attended by success.

7 cases of scorbutus were treated, and in every instance in prisoners undergoing lengthened sentence, and who on an average had been three years and a half in confinement at the date of admission. Only one of these patients had ever been employed at out-door labour. One death unexpectedly resulted in the case of a weakly young man. This patient had been gradually declining in flesh and strength, but there were no further evidences of the disease than slight sponginess of gums and œdema of the feet and ankles. In this condition diarrhœa suddenly came on, and proved fatal in a few hours. The type of the disease witnessed has not, however, been severe, and in general has rapidly disappeared under the effects of lime-juice and animal diet, with morning and evening exercise beyond the limits of the jail.

Phlegmon was of common occurrence, and 40 cases were admitted, the majority in men recently imprisoned, in whose case an unwonted sedentary life, and a scale of diet more liberal than ordinary, may have helped to induce it. A few cases have also

happened in those working out of doors, where the origin of the complaint has generally been referred to irritation produced by wearing fetters, the unnecessary weight of which (3½ lbs.) rendering such an occurrence occasionally difficult to prevent.

36 cases of dracunculus have been treated, 26 of which were admitted in the months of April, May, and June. All were in prisoners recently committed, whose term of confinement had in no instance exceeded six months. The occurrence of this complaint in jail must therefore be regarded as purely accidental. Data connected with the history of each case, as bearing on its origin, were regularly kept, but nothing further can be gleaned from these, save the fact that hereditary predisposition, derived from one or both parents, has almost invariably been acknowledged to exist. The cases met with have as usual been tedious, and many of them troublesome from recurrence. No mode of treatment has appeared satisfactory in hastening the cure, save in a few, where the worm was met with immediately under the skin, when incision has enabled it to be extracted at once, or at farthest within a day or two.

Police Corps.

The average strength of the corps for the year has been 463; but as 300 of the men are constantly absent from head quarters, the proportion of sick has been materially less than what it otherwise would have been, inasmuch as the more severe cases alone have required to be sent in for treatment. Thus the total number admitted has only been 221, or a ratio of 47·73 per cent. to strength. The most prevalent forms of disease have been fevers, dracunculus, phlegmon, and rheumatism. There were 100 cases of fever treated, the quotidian intermittent type being by far the most common. Many of the cases of this and the remittent form were contracted in the districts, and necessarily only forwarded to hospital after considerable delay, hence not a few proved severe and difficult to treat, from their period of duration, and the concurrent weakness thus induced. 2 deaths occurred during the year, both from fever, the patients being exhausted at the time of admission. The other diseases have

differed in no respect from those generally witnessed, and have presented no peculiarities in their course or treatment deserving of particular mention.

Vaccination.

Supplies of lymph were forwarded by the Vaccinator of the district from time to time throughout the year, but, as heretofore, it was found impracticable to carry on vaccination during the rains. The lymph appeared to undergo rapid decomposition from the influence of season, and either proved perfectly inoperative, or if any result followed, it was generally as a simple pustule, maturing on the third day; but rarely, from the commencement of the monsoon till the setting in of cold weather, did the true vesicle follow the operation.

Year.	Total Vaccinated.	Successful.	Failed, doubtful, and lost sight of.
1849–50.	239	210	29
1850–51.	527	457	70
1851–52.	207	154	53
1852–53.	154	92	62

Vaccination has been ill received, and I am sorry to remark, that although all legitimate means have been used to extend its benefits, the result stands in very unfavourable contrast with that of preceding years. The length of time that has elapsed since the last occurrence of small-pox in 1850 appears to have rendered the people callous to advantages which, during the prevalence of the epidemic, they have been solicitous to obtain, and thus the general impression is, that it will be time enough to have recourse to the prophylactic when the disease recurs. Superadded to this indifference, there exists a vast amount of prejudice and superstition regarding the operation, which the experience of the year has satisfied me mere individual efforts are utterly inadequate to overcome. It is not, therefore, a passive opposition, arising from apathy, that has to be contended against, but rather a degree of antagonism which persuasion and solicitation have alike been unsuccessful in removing.

Among the lower classes, and more especially the Mussulman portion of the population, these objections are deepest rooted, while in those in whom prejudice is generally supposed to be

dominant--the Brahmin caste--there has been comparatively little opposition, and many of this class have voluntarily submitted their children for vaccination, in the full belief of its protective influence.

The significant fact that out of a population of 26,000 only 154 have been vaccinated, will best illustrate the degree of opposition encountered; and while suggestive of the mortality that in all probability would result from a visitation of small-pox, it strongly points to the necessity of overcoming existing prejudice. Unless, however, by the exercise of legislative authority, it is difficult to perceive how the present requirements can be fulfilled; for although the opposition experienced will doubtless gradually disappear with the progress of education and enlightenment, still it must be regretted that a subject of such vital interest should be left to find its remedy at the slowly innovating hand of time.

Ahmednuggur, April 1st 1853.

REMARKS

ON THE

PATHOLOGY AND TREATMENT OF BERI-BERI.

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Presented August 1853.

The term beri-beri has been for a long time applied by writers on tropical disease to a train of dropsical symptoms.

The unnecessary introduction of this word into our Indian nosology has, I am satisfied, served to retard and obscure our knowledge of the pathology and treatment of general dropsy, as it presents itself to our notice in the Natives of India.*

In the month of February 1851, I called the attention of a meeting of the Society to this subject, and explained the views respecting beri-beri which I had been in the habit of stating to the students of the Grant Medical College. This I did by submitting to the meeting an extract from my lecture on this disease.

In June 1853 several cases of beri-beri were admitted into the Jamsetjee Jejeebhoy Hospital, and were carefully observed by me.

They confirmed the opinions which I had previously expressed to the Society in regard to the pathology of the affection.

In my present communication I shall in the first place again quote the extract from my lecture on beri-beri, and then narrate

* There has been also confusion from confounding beri-beri with barbiers; the latter a term applied unnecessarily, by former writers on tropical disease, to a train of nervous symptoms. Both terms should, I think, be erased from the nomenclature of disease.

the circumstances connected with the cases of the disease lately observed by me in the hospital.

Extract from a Lecture on Beri-beri.

"The symptoms of this disease sometimes advance gradually; at other times they develope themselves suddenly. When they have been gradual in their approach, the individual for several days experiences a sense of weakness, and inability, or unwillingness to exert himself, and shortly afterwards to these symptoms are added pain, numbness, stiffness, with more or less œdema of the lower extremities. There is also more or less dyspnœa experienced, with a sense of oppression and weight at the epigastrium. The œdema does not continue confined to the extremities, but extends to the trunk and face, occasioning a general puffed and bloated appearance. The weakness of the limbs and the dyspnœa are particularly complained of on motion. As the disease advances, the dyspnœa increases, the face becomes more swollen and bloated, and the lips livid. The numbness of the limbs increases to such an extent that they become almost paralytic, the oppression at the epigastrium becomes aggravated, and frequent vomiting is excited, and the ejected matters are sometimes mixed with blood. The urine is scanty and high-coloured, sometimes almost suppressed; the thirst is great; the pulse is at first quick and small, or unaffected, then it becomes irregular, intermittent, and fluttering. Palpitations are experienced, attended with a sense of suffocation, a sinking pulse, and death.

"These trains of symptoms may run their course in from two to three weeks; or the course may be much more rapid, and when so, the numbness, the stiffness, and œdema of the lower extremities become quickly followed by the dyspnœa, the palpitation, and the sinking pulse.

"Now, what are all these but the symptoms which attend more or less on serous effusion into the connecting areolar tissue of the extremities, the cavity of the abdomen, that of the pleura, the pericardium, or into the air cells of the lungs, and their connecting areolar tissue—in fact, the symptoms of general dropsy more

or less extensive, more or less quickly forming. Dr. Watson, in his excellent lectures, thus writes of dropsy:—"Now from whatever cause this watery condition of the whole body may arise, the effects resulting from the presence of the *water* are the same: and of what do patients in this state usually complain? Why, of shortness of breath and palpitation of the heart; of a sense of impending suffocation if they attempt to lie down or actively to bestir themselves, of tightness and distress across the epigastrium, relieved somewhat by eructation, augmented by food and drink; of weight and stiffness of the limbs, and sometimes of drowsiness."

Now let us inquire what in fatal cases of beri-beri are the morbid appearances found after death. Why, dropsical effusions into the subcutaneous areolar tissue, œdema of the lungs, effusion into the sac of the pleura, into the pericardium, into the peritoneal cavity, and into the cranium. In some cases traces of old or recent inflammatory action of internal viscera may be found; but these form no essential part of the disease. It was the opinion of Dr. Malcolmson, entertained chiefly on account of the paralytic symptoms, that disease of the spinal cord or its membranes had much to do with this disease. This opinion, however, cannot, I think, be sustained. We must look upon this disease as a general dropsy; and in order to the right understanding of its pathology, let us call to mind the circumstances under which general dropsy generally presents itself.

1. There is one form to which the name active is given, arising when the surface of the skin, after free exhalation, has become suddenly exposed to cold: the excretion of fluid by the skin is stopped; the blood is driven inward; the kidneys for some reason or other do not take on their compenseting action—they become congested, and general dropsy with scanty urine is the result. This form of active dropsy involves, I believe, a certain degree of fulness of the vessels. Of general dropsies, more passive, we have several forms, depending on different deranged conditions—on congestion of blood, local or general; on disease of the heart or of the lungs, or perhaps merely on feeble action of the heart; also on disease of the kidneys favouring retention of urea, with consequent determination or

congestion. Dropsical effusion under both these circumstances, and more particularly when related to diseased kidney, will more surely take place if cold or wet be applied to the surface of the body, and the excretion of water by the skin be thereby impeded. Again, dropsy may arise, not from disease of the heart or lungs, or kidney favouring congestion, but from a deteriorated state of the blood—a blood, too, abounding in watery constituent; and here, too, the evolvement of the dropsy will be favoured by the influence of external cold upon the cutaneous secretion. Then, if diseased heart, or lungs, or kidneys, or blood too dilute, or vessels too full of blood, in their separate influences, lead to dropsical effusion, how much more surely will this result take place if two, three, or more of these conditions are associated together—if, for example, we have disease of the kidney associated with disease of the heart, and the sufferer from this complication be exposed to the influence of external cold; or if we have the vessels tolerably full of blood, but of blood abounding in watery constituent, and circulated by a feebly acting heart, and the sufferer from this complication be exposed to the influence of external cold?

Beri-beri I look upon to be a general dropsy of this complicated character, for the most part appearing when the vessels are tolerably full of blood, and a blood abounding in watery constituent, and following exposure to external cold. No doubt in many cases the occurrence of the dropsical effusions is favoured by existing heart, lung, or kidney disease.

But how does this state of the blood arise? It is, I believe, that condition of the blood which is present in the scorbutic diathesis, and which it is reasonable to believe may for some time precede the appearance of those phenomena which are characteristic of *scurvy*. And let us further recollect, that among the early derangements of the scorbutic state is the impaired irritability of muscular fibre, that of the heart included; and we have as predisposing conditions of dropsy, not only the watery blood, but vessels tolerably full of it, and this blood propelled by a feebly acting heart. Let us suppose an individual in this state to have the surface of the body exposed to an atmosphere

cold and damp, or to the chilling influence of piercing winds, and we have conditions surely sufficiently predisposing and exciting of general dropsy, the more certainly so if the skin have been previously actively perspiring, and the kidneys, from congestion or structural defect, do not readily take on a compenseting action.

Do the circumstances in which beri-beri appears justify the view which I have now taken of its pathology? I believe they do. The disease has been chiefly observed in Ceylon, on the Malabar Coast, in the Circars, and in the lascars in ships on the adjacent seas. There has been a good deal written on this disease by the army surgeons in Ceylon, by medical officers of the Indian Army—by Dr. Malcolmson and others, and more lately by Dr. Carter; but, on the whole, there is a want of precision in these writings on the points on which we chiefly desire information. There is too much dwelling on symptoms, which are not difficult to understand, and too little of precise statement in regard to etiological circumstances, these being, it seems to me, the most important to determine. I would except, however, from these general remarks Dr. Carter's very excellent paper in No. VIII. of the Transactions of the Bombay Medical and Physical Society. In it there is much precise and valuable information. There is, however, still enough, I believe, in these accounts to justify the belief that beri-beri, more particularly in its acute form, will be found to present itself in individuals favourably circumstanced for the development of a scorbutic taint, and who while in this diathesis have been exposed to the sudden cooling of the surface of the body from sudden alternations of temperature or of wet; to cold dry winds or wet winds, or to exposure to damp from lying on the ground wet with rain or dew, while the body has been inadequately protected with clothing. It seems to me that the rational manner in which to consider each separate case of beri-beri is to view it as one of general dropsy, and to inquire into it exactly in the manner in which we do into other cases of general dropsy. We endeavour to ascertain the state of the heart, the lungs, the kidneys, the condition of the blood; we pass in careful review the circumstances

in which the individual has been placed, with the view of ascertaining whether he has been exposed to causes which we believe to be predisposing and exciting of dropsy. It is only by keeping clearly in view the general pathological principles involved in such an inquiry that we can hope to reconcile the seeming contradictions of the confused details of which the narratives of this disease are for the most part composed. To me it seems, then, that beri-beri is a general dropsy, and that in regard to each instance of it, the question ought to be, what is the pathology of this case of general dropsy? Frequently, I believe, it will be found that the scorbutic diathesis and the influence of external cold are the only determining conditions.

In these remarks there have been discussed the symptoms, the pathology, the causes of beri-beri. The treatment will not detain us long—it resolves itself into prevention and cure. If it be the case that the scorbutic diathesis is the predisposing condition of the general dropsical state to which the name beri-beri is applied, then attention to those means which are preventive of scurvy must also be preventive of beri-beri. And if external cold be the ordinary exciting cause of beri-beri, then attention to clothing and avoidance of exposure must also be very important preventive means.

In regard to the treatment of the disease when fairly formed, it must be in accordance with those principles which guide the treatment of general dropsy. In the acute forms of this disease, in a full and robust body, with excited vascular action, there may be scope for general blood-letting, but it can be only under such conditions of the general system and of the circulation that this measure can be admissible, and these conditions will not, I apprehend, be found to be often present in beri-beri. Then we may, in other cases in which the vascular action is not depressed, in which there is no irritation of the gastro-intestinal mucous lining, endeavour to reduce the dropsical effusions by active purgation—by the use of elaterium for example, or other purgatives, combined, it may be, with mercurial purgatives. Then there are those other cases in which we cannot safely induce free watery excretions by the intestinal surface, but must

endeavour to do so by the channel of the kidneys, by judicious and varied combinations of diuretics; and then there may be cases in which the action of the heart is depressed, and in these stimulants must be at the same time given. Nor must we forget that the skin may in some instances constitute an appropriate channel by which to lessen the watery constituent of the blood, and favour the absorption of the dropsical effusions. The vapour bath, or the hot air bath may be used with this view. Now you will find in the account of this disease that some recommend general blood-letting, others purgatives, others diuretics, and others stimulants; and the same may be said of other forms of dropsy. But if the pathology of dropsy be rightly understood, then it must be acknowledged that there is no special way of treating it. Those means which are the best in one case may be the very worst in another; and the same must be true of beri-beri.

Account of Cases of Beri-beri observed in the Jamsetjee Jejeebhoy Hospital in June 1853.

In the month of June 1853, 4 cases of beri-beri were received into the Jamsetjee Jejeebhoy Hospital. The sufferers were lascars belonging to a ship which had just arrived from sea. I learnt that many others of the crew had also suffered. One individual died on his way from the ship to the hospital. An inquest was held on the body. I suggested to the Coroner the expediency of eliciting information relative to the length of the voyage, and the management of the crew. To this Mr. Arthur obligingly assented. I shall first quote at length the deposition made by the Captain of ship; then state the important facts in the history of the cases admitted into the hospital; and finally inquire whether they confirm or not the view previously taken of the pathology of the disease:—

William Eames, on being duly sworn, says:—I am Master of the ship *Faize Allum*, of the port of Bombay, and have been constantly commanding, or been Chief Officer of vessels trading out of Bombay, with a lascar crew, since the year 1838. I last left Bombay on the 3rd day of June 1852, with a lascar crew of sixty-five men and boys; and the deceased, Bhana Moorar, aged

about forty years, and deceased Jadow Dewa, aged about twenty-five years, both Hindoos, formed part of the crew. We proceeded from Bombay to Singapore, and from thence to Siam, and returned from thence to Singapore, and so back again to Siam; and from thence to Singapore, which place I quitted for Bombay on the 3rd March this year, expecting to make the voyage in seven weeks, the average passage being about two months. I had on board curry-stuff, rice, water, dall, ghee, salt, &c. as prescribed by the regulations, with a good supply of water; and during such time as the ship was in harbour always supplied the crew with greens, fresh fish, and fresh provisions. The crew all remained healthy till about the 21st day of May last, in latitude 10° N. longitude 64° W. We had then been two months and eighteen days at sea. On the 15th day of April I was within about 70 miles or thereabouts of the island of Ceylon, but being unable to stand the strong current and west winds then blowing, after consulting with my Serang and Chief Officer and passengers, I determined on relinquishing the attempt to get round Ceylon, and bore away for the line, to come up to Bombay by the Southern Passage, round the Laccadives and Changos, and ran to the south of the line as far as 8° 49′, and then to the westward as far as 63° W. and crossed the line again, running north, about the 6th or 7th May, and during most of the time had rain and squalls. Most of the water having been consumed, we filled up the water casks with rain water, collected on the surface of a clean awning. After making the line on the 6th of May, we had light weather, with occasional squalls and constant rain, and came on with the SW. monsoon up to 16° N. latitude on or about the 2nd June, and arrived in the harbour of Bombay on the 6th June. I consider that I first fell in with the SW. monsoon about three degrees north of the line. The crew were all healthy up to the 21st of May. When in latitude 10° N., longitude 64° W., symptoms of disease first showed themselves. The deceased Jadow Dewa complained of pains in his feet, and loss of strength down the legs, and pain in the chest, with difficulty of breathing, and constipated bowels. I gave him jalap and cream of tartar, and

to rub on the chest hartshorn, laudanum, and sweet oil. The crew since the 15th of April had been on a reduced allowance of about ten pounds in ninety pounds of rice, fish and water full allowance, the latter being rain water. Between the 21st day of May and 6th of June, eight other men were seized in the same manner, and all died; the average suffering about four or five days; a Portuguese sepoy died in three days. The deceased Jadow Dewa appeared to be recovering fast, and left the ship on the evening of the 6th of June. Bhana Moorar also appeared convalescent, and left the ship in my dingy. All the survivors of the crew are landed, the voyage being completed. The passengers, 12 in number, Natives, and myself and officer, and the majority of the crew, are well. We drank the rain water very freely, and I believe the deceased died of a disease called the *beri-beri* of Ceylon. I had a good medicine chest on board, and treated those taken ill according to the instructions laid down in Dr. Thomas' book of medicine. We had no liquor on board the ship. I offered the crew pickles and vinegar, and also sugar, but they refused to eat it. The passengers and myself used pickles, sugar, and vinegar freely, but the crew declined till latterly. The whole number who were attacked were about 35, of whom 10 have died. We were in the latitude of Cochin when the disease first appeared, and were about 10° to the westward of the coast of India, with light NW. and NE. winds. The crew were protected from wet as far as possible. The disease attacked persons of all ages, but principally the old and more infirm of the crew. Further I know not. The cargo consisted principally of sugar in bags, of Malling ivory, teakwood, plant and sapan wood, and raw silk. The hatches were kept constantly open when the weather would permit, the forecastle well cleansed and fumigated with powder burnt and benjamin."

The Jury returned the following verdict :—" Deceased died of beri-beri."

Case 1.—Purshotum Zeena, a Hindoo kalasee, of the ship *Faize Allum*, twenty-five years of age, a man of stout frame, was admitted into the Jamsetjee Jejeebhoy Hospital on the 7th of June 1853. He had been ill sixteen days. The feet, legs,

and thighs are œdematous, and, in consequence of the stiffness of the thighs and groins from the swelling, he walks with a waddling gait. The pulse is easily compressed. There is no abnormal dulness of the præcordial region, and the sounds of the heart are normal. The bowels are rather confined, and the urine is scanty. He complains of uneasiness at the epigastrium and the hypogastrium. There is no vomiting; the tongue is not coated, but is rather florid. There is no sponginess or discoloration of the gums. He continued in hospital till the 27th June, when he was discharged well. For some days after admission he complained of uneasiness and sense of weight at the epigastrium, and there was abnormal dulness on percussion, to within two inches of the umbilicus. The urine showed no traces of albumen. He was treated with occasional doses of compound powder of jalap, the anti-scorbutic mixture of the hospital, a diet with fresh vegetables, and lemonade, and a small allowance of arrack. Under this treatment the dropsical symptoms and the fulness at the epigastrium disappeared, and he left the hospital quite well.

Case 2.—Bhowan Rama, a Hindoo kalasee, of the ship *Faize Allum*, thirty-five years of age, and of stout frame; ill for fifteen days. The legs, thighs, and feet are very anasarcous, aud his gait is waddling from the stiffness of the legs and groins. The pulse is very feeble, and the urine scanty. He has uneasiness at the epigastrium, but no dyspnœa, except after walking. The sounds of the heart are normal, and there is no dulness of the præcordial or other regions of the chest, and the respiratory murmur is distinct; the tongue moist and without fur; the gums discolored, but not swollen; the teeth feel tender on eating; urine not albuminous. The treatment followed was the same as in the first case, with the addition of the occasional use of the warm bath. He was discharged well on the 27th of June.

Case 3.—Visram Narrayen, a Hindoo kalasee, of the ship *Faize Allum*, twenty years of age, ill fourteen days, was admitted into the Jamsetjee Jejeebhoy Hospital on the 7th June 1853. There was general anasarca. The pulse was feeble. There was no abnormal præcordial dulness; the sounds of the

heart were normal ; there was slight fulness of the abdomen ; no swelling of the gums. On the 8th and 9th, the pulse became feebler, and the breathing oppressed ; the urine very was scanty, but showed no traces of albumen. He died on the afternoon of the 9th. He was treated with stimulants—ammonia and arrack. The body was examined two hours after death, and Mr. Lisboa has favoured me with the account of the appearances.

Head.—On opening the cranium, about 5 ounces of serous fluid oozed out. The structure of the brain, cerebellum, pons varolii, and medulla oblongata was healthy. The ventricles of the cerebrum contained the normal quantity of fluid.

Chest.—The cavity of the chest contained only 2 ounces of thin transparent fluid. Both lungs collapsed freely, and their structure was healthy ; they showed no appearance of being œdematous. The heart appeared slightly enlarged. On opening both the right and left cavities, they were found to contain a thin red fluid and a few soft red coagula of blood ; the fluid in the right ventricle was frothy.

Abdomen.—The abdominal cavity did not contain more than 2 ounces of thin transparent serous fluid. The peritoneal surface of the intestines was of reddish colour from congestion ; all the abdominal viscera were more or less congested, but their structure was healthy. The liver presented appearances of congestion more than any other organ ; from its incised surface fluid blood flowed freely.

Case 4.—Jadow Dewa, a Hindoo Kalasee, of the ship *Faize Allum,* 25 years of age, ill sixteen days, was admitted into the Jamsetjee Jejeebhoy Hospital on the 7th June 1853. There is general anasarca, the abdomen is rather full, and is distinctly fluctuating; the breathing is oppressed ; there is no abnormal præcordial dulness ; the sounds and action of the heart are irregular. He complains of pain at the epigastrium ; the pulse very small, and the skin coldish ; the gums are discoloured, but not swollen. He died on the morning of the 8th.

The body was examined five hours after death ; and I am indebted to Mr. Lisboa for the account of the appearances.

Head.—On removing the calvarium, about 5 ounces of thin

serous fluid oozed out. The structure of the brain, and of the other contents of the cranium, was healthy. The ventricles of the cerebrum contained a little more than the normal quantity of thin transparent serum, with a few bubbles of air.

Chest.—Both cavities contained about 12 ounces of serous fluid. The right costal pleura adhered to the visceral, by means of old bands of areolar tissue, which was also infiltrated with serous fluid, except at the lower part of the chest, where there was a sort of sac, holding about 4 ounces of serum. The left lung collapsed freely. The structure of both was healthy, except that it appeared to be slightly compressed. On pressing the incised surfaces, a small quantity of frothy serous fluid oozed out. The heart was apparently enlarged (dilated); both auricles and both ventricles were distended with fluid blood, and some few soft red coagula. The fluid in the right ventricle contained a few bubbles of air. The structure of the heart was healthy. All the abdominal viscera were more or less congested, but otherwise they were healthy. The peritoneal lining of the abdominal cavity, and that covering the intestines, presented a reddish appearance.

The blood, examined under the microscope, showed a normal state of the corpuscles.

Remarks.

The circumstances under which beri-beri made its appearance in the ship *Faize Allum* are certainly confirmatory of the view which I have taken of the pathology of the disease. The ship had been two months and eighteen days at sea. The crew were for the last month on somewhat diminished rations, and at no time did anti-scorbutics form part of the dietary. The weather was bad, and there was exposure to fatigue. The disease appeared on the 20th May. The weather during the fifteen days preceding had been wet and squally. Of a crew of 65, 35 were attacked, and 10 died.

The officers and passengers of the ship did not suffer from the disease. They used anti-scorbutics freely, and we may assume, at least as regards the passengers, that they were not exposed to

the inclemencies of the weather ; and as regards the officers, that they were by clothing better protected than the lascars.

It is true that in the 4 cases which came under my observation in the hospital, the undoubted external phenomena of scurvy were not present. In 2 the gums were discoloured, but they were not swollen and spongy. But the view taken of the pathology of the disease does not require the presence of scorbutic phenomena. There can be no doubt that the diathesis is of gradual formation, requiring, in all probability, the influence, for a considerable period, of the conditions which induce it, before the characteristic phenomena of the disease appear. Nor can it be questioned that the changes which the blood is gradually undergoing in the formation of this diathesis must be very favourable to deranged action of various kinds, under exposure to cold as an exciting cause ; and must be favourable, when the surface of the body becomes chilled, to the occurrence of internal congestion, with dropsies and occasional hæmorrhages. It is, indeed, only when the diathesis is partially formed, that we are at all likely to meet with beri-beri, for a really scorbutic crew is not likely to be fit for duty, and exposed to wet and squally weather.

Though the evident phenomena of scurvy were absent in these cases, still there were facts observed which justify the belief that the diathesis was present in some degree. In both the fatal cases the blood was found more or less fluid after death. In all the cases the feeble action of the heart was very remarkable : in 3—the two successful cases and 1 fatal—this could not be attributed to thoracic dropsical effusions, for in none of these 3 cases was there effusion into the sacs of the pleura or the pericardium ; nor was there œdema of the lungs. Again, in the 2 fatal cases, all the cavities of the heart were dilated and filled with blood, showing that the circulation ceased from failure of irritability of the muscular fibre—that death was by syncope.

This defective irritability of the heart points to something in the pathology of the disease, in addition to the dropsical effusions, and, perhaps, there is no state of the system more generally characterized by impaired irritability of the muscular fibre than the scorbutic diathesis. There is no fact more familiar than the

occasional occurrence of sudden death in scorbutic patients by syncope.

There are other facts of interest to note in these cases. A sense of weight and uneasiness at the epigastrium is a common symptom of beri-beri. In one of the successful cases the enlargement of the liver was very evident from percussion. In both the fatal cases the congested state of the liver was marked. This symptom, then, I believe, is due to congestion of the liver. The presence of this congestion, and the altered state of the blood, also explain well the occasional occurrence of hœmatemesis in beri-beri. In these cases there was complete freedom from heart or kidney disease.

Then, as respects prevention and treatment, the principles are sufficiently clear. By suitable dietaries, to prevent the formation of the scorbutic diathesis; by suitable clothing, as far as practicable, to protect the crew from inclemencies of weather. In regard to treatment: 1*st*, the use of anti-scorbutic regimen and remedies; 2*nd*, to regard the feeble pulse as a state of action independent of the dropsical effusions, and to give stimulants more or less freely; 3*rd*, to remove the dropsical effusions by purgatives or diuretics, being guided to the use of the one or the other by the state of the pulse; 4*th*, to increase the cutaneous capillary circulation, by friction and warm clothing. The use of the hot air bath or warm bath must require caution, in consequence of the increased depression of the heart's action which follows its transient excitement from these means. They had better, I think, not be included as part of the regular treatment of the disease.

It is altogether unnecessary to take up the time of the Society with details of treatment. It is sufficient to state the principles which it seems to me ought to be kept in view. I attach great importance to the fact, which from these cases is, I think, clearly made out, that the feeble pulse is not consequent on the functions of the heart or lungs being interfered with by the dropsical effusions, but is dependent on the impaired irritability of the muscular fibre of the heart—one of the phenomena of the scorbutic diathesis. It would therefore, I think, be an error in

practice, if we expected the force of the heart to improve under the mere removal of the dropsical effusions by purgatives or diuretics. The use of stimulants must go hand in hand with that of these evacuants, indeed must in many cases, in advanced stages, be the only means we can safely avail ourselves of; and while we keep up the action of the heart, and remove the effusions, it is, if these pathological views be correct, also a very evident indication to improve the diathesis by anti-scorbutic means.

REPORT

ON THE

HEALTH OF THE 1ST BOMBAY EUROPEAN REGIMENT (FUSILIERS), FROM 1ST APRIL 1846 TO 31ST MARCH 1854.

BY F. S. ARNOTT, M.D.,
Surgeon of the Regiment.

Presented June 1854.

DURING the discussions on the India Bill in 1853, it was stated in the House of Lords by a former Governor General of India, that the Honorable Company's European regiments were absorbed, and required to be renewed, every eight years; whereas H. M.'s regiments serving in India needed renewal only every twelve years. The announcement was startling, and attracted very general attention; but the subject not having been very attentively considered, and the data by which it could be settled not being easy of access, few were prepared to pronounce an opinion as to its correctness or otherwise. But an impression was entertained that it ought to be received with some degree of caution, as Lord Ellenborough, in mentioning the circumstance, drew an inference disadvantageous to the European portion of the Honorable Company's army; and therefore it was presumed to have no better foundation than a desire to ridicule and condemn the whole system of Indian management. His Lordship, moreover, admitted that his information was derived from documents obtained at the Board of Control twenty-five years previously, but he did not give the dates of the documents, or the period to which they had reference. This seemed the more extraordinary, because, to establish a point of such vital

importance to every soldier belonging to the Honorable Company's army, and of such deep interest to every Military and Medical Officer connected with the European branch of the service, many more recent statistical returns than those referred to must have been in existence, both at home and in this country; and it is difficult to understand why they were not made use of rather than those of such ancient date. There were grounds, therefore, for the inference, that some error or mistake had occurred; or that, admitting the comparison to be correct at that distant period, it could not be applicable to the present state of the Honorable Company's army.

The archives of the Board of Control are not very accessible, and it is difficult to conjecture the exact dates of the documents referred to, or the periods they embrace. But there seems good reason to believe that the data from which they were framed must have belonged to a remote period, when it is generally admitted that the Honorable Company's regiments had not —with regard to interior economy and discipline—made such progress as the Royal regiments towards the state of perfection they have now attained, and also when the difference between the two services was greater than it is at present. There seems, therefore, no reason to doubt that the disparity pointed out did at that time exist; but it becomes a question whether—when with respect to discipline, drill, equipment, duty, general management, and efficiency, the two services are by all competent judges considered to be exactly on a par—it is still in existence, or, if so, upon what causes it depends; and if there are more causes than one, the extent to which they severally operate.

It is probable, that for the satisfactory solution of this question there is already ample information upon record, but I am not aware to what extent it is available. That no other member of the House of Lords was in possession of it seems clear, for the statement, as well as the inference drawn from it, met with little notice or comment, and consequently the allegations went forth unchallenged, uncontroverted, and unexplained. The readers of the debates, therefore, naturally received the announcement as

unassailable, and, not comprehending the reason of the difference, could only attribute it to something faulty and objectionable, as indeed was insinuated. Resting upon these grounds, therefore, an impression prevails that H. M.'s regiments serving in India require only $83\frac{1}{3}$ recruits annually to keep up the strength to 1000 fighting men, whilst the Honorable Company's European regiments need 125 recruits annually to keep them up to the same strength; and, as a consequence of such rapid changes in the latter, that they are correspondingly inferior to the former.

The comparison is very striking, and it has given an impulse and importance to this very interesting subject which it otherwise could not have attained. I should be glad if the Medical and Physical Society of Bombay undertook its thorough investigation, and by this means elucidate and define the rates of decrease arising from the many different causes; and as the investigation would involve an inquiry into the system of recruiting and invaliding, the rates of mortality, and several other points, and might lead, probably, to many improvements in regard to the condition and health of the European soldier in India, it seems no unworthy subject to undertake.

But just and correct conclusions can only be arrived at by extensive comparisons; and for the proper investigation and elucidation of such a subject far more comprehensive data are required than are within reach of a medical officer at an outstation. Whether or not the Society is already in possession of such data I am unable to say; but it occurs to me, if medical officers holding European charges (who, indeed, may in a measure be considered responsible for a large share of the extraordinary disparity pointed out) were to contribute the results of their experience, many important facts and much useful information might be collected, and the Society would thus become the depository of a mass of very valuable data, from which hereafter might be framed accurate statistical returns of all the Honorable Company's troops down to the latest dates. The unconnected observations and detail of isolated facts upon our systems of recruiting and invaliding, the rates of mortality, and the general economy of the Honorable Company's European regiments,

furnished from different quarters, might afterwards be generalized, their differences noted, and the causes resolved and analyzed into their different elements, assigning to each its individual character and importance, with the certain and immediate result of obtaining a clearer and more general knowledge than now exists of the organization of the European regiments; and eventually effecting, perhaps, great improvements in the moral and physical condition of the European soldier serving in India.

Labouring under the disadvantage of being at a distant station, and, therefore, restricted to the information furnished by my own hospital reports, I can only attempt to contribute my mite towards such a desideratum, which to the extent of my ability I cheerfully afford. I have therefore consulted the hospital and regimental records for the last eight years, and from them have constructed some returns, which I beg to place at the disposal of the Society. In preparing them, I have not confined myself merely to returns of "admissions" and "deaths," which, however valuable in themselves,—generally speaking,—give a very vague idea of the changes to which an European regiment in India is liable. Although the mortality is, even under the most favourable circumstances, lamentably high, and is looked upon as the principal cause of decrement, yet, upon an average, the ordinary bills of mortality leave at least half of the annual loss unaccounted for. I have therefore exhibited the history of every soldier and officer who has belonged to the regiment for the octennial period, and have given the entire loss, whether by death, invaliding, transfer, or discharge; as well as the entire increase by recruits from Europe, enlistment or transfer in this country, and likewise the numbers still present; so that the annual and total increase and decrease may be seen at a glance. These returns are complete and accurately correct; but how far they may be taken as an index of the condition of the whole of the European portion of the Indian army can only be decided when further data are obtained. Of course they can and ought not to be implicitly relied on as exact indications of the average annual increase and decrease, from all causes, of the Honorable Company's European regiments; but they may, perhaps, in the

mean time, and pending further inquiry, be taken as an approximation thereto; and in that case, they will enable us to judge how far they correspond with the estimates made twenty-five years ago. But for the final settlement of the question the investigation must be prosecuted far beyond the means in my power. Here I may remark that further researches may perhaps discover that the comparison even still holds good, because, although the condition of the Honorable Company's regiments has, since the date of the returns referred to in Parliament, very much improved, yet that of H. M.'s regiments serving in India has in a corresponding ratio likewise improved, so that instead of $83\frac{1}{3}$ recruits annually required to keep up the strength to 1,000, they only need $62\frac{1}{2}$. In other words, a Royal regiment has to be renewed only once in 16, instead of, as formerly, once in 12 years. Should such be the case, and the Honorable Company's European regiments still demand more frequent renovation than H. M.'s regiments serving in India, the causes of such difference would be instructive and valuable, and the discovery of them might lead to improvements in the condition of the former which are at present unthought of.

Whilst preparing these returns, other matters suggested themselves, which appeared worthy of noting down, so as to render the returns more perspicuous; and I have therefore engrafted upon them a few observations, and a few supplementary tables, showing the rates of invaliding, of sickness, and of mortality, and the rates of deaths from each class of disease. These I have prefaced by a short history of the regiment for the last eight years. I have also given a few general remarks, which, although not exactly professional, are yet not beyond the province of the medical man. An experience with European soldiers, protracted beyond ordinary length, may, perhaps, justify their appearance. Had my researches been further extended, they would doubtless have been more satisfactory. I have limited myself to the last eight years, because it is the cycle in which, according to the returns quoted in Parliament, the entire absorption and renewal, *ab initio*, of the corps should have been witnessed; and more particularly because I wished to confine myself to the period I have held medical charge of it.

In this manner, I have endeavoured, as far as my opportunities serve, to supply data for a comparison of the present with the past condition of the Honorable Company's European forces; and at the same time, in illustration of it, to give a complete medical history of the Fusilier regiment for the last eight years. But the causes of sickness and mortality vary greatly, and depend upon such widely different influences of locality, duty, &c.—and even the late regulations regarding "discharge from the service" affect regiments so variously,—that the most accurate returns can only be properly understood when accompanied by a concise statement of the circumstances in which the body of men to whom they refer has been placed. For this purpose, I may be allowed to anticipate a little, and to state, that since 1846 the Bombay Fusilier regiment has been in no wise favoured with respect to climate, locality, accommodation, or duty; but, on the contrary, it has been exposed to all the ordinary causes of sickness and loss in no minor degree, including the casualties of war, and the ravages of epidemic disease. It has served within and without the Honorable Company's territories; within and beyond the tropics; and in climes ranging from 13° to 34° of north latitude, and from 44° to 74° of east longitude. It has been stationed on the shores of Arabia, and of Scinde, and in far inland provinces. At places where, for the greater portion of the year, the cool and moist sea breezes prevail; again, at stations on the highlands of the Deccan, 1,800 feet above the level of the sea, where for a similar portion of the year the arid hot winds, surcharged with dust, sweep over its vast bare plains, and where the skin, nails, and nostrils are parched, curled, and dried up. The Fusiliers have taken their share in the field of battle, and in the performance of ordinary garrison duty; they have made long marches, and have been again stationary; they have enjoyed a profusion of supplies, and have been limited to Commissariat rations. The regiment has had its ranks thinned by the fire of the enemy; it has been exposed to great vicissitudes of temperature, in crowded tents with the thermometer at 114°, and a few months afterwards at freezing-point, with snow all around. It has been conveyed from place to place, sometimes in

small river steamers, and sometimes in large sea-going vessels. It has been at times located in small, confined, and comfortless pendals, and at others in lofty, capacious, and commodious barracks; and again in pendals which have been described "a disgrace to the Government of India." I may add that I have seen sickness prevailing so little, that for two months the admissions into hospital did not reach 12 per cent. of the strength; and, on the other hand, I have seen, in the same space of time, the admissions into hospital exceed the entire strength of the regiment, at the rate of 120 per cent. With a strength exceeding a thousand men, I have known six consecutive months pass over with only one burial; again, I have witnessed funeral parties consign to their last resting-place 48 of their comrades, lost by disease in two consecutive days. I have seen the regiment decimated by disease in nine days, and reduced in the space of a year from all causes at the rate of 215 per 1,000, which would have annihilated it in less than five years; and I have seen the annual reduction so low as 47 per 1,000,—a rate of decrement which would require twenty years for its absorption. I have known the "discharged" from the service not exceed 1 in twelve months, and by the operation of the late order I have seen them amount to 22. But most of these points will be adverted to hereafter in detail. Enough, I think, has been said to show that since 1846 the Fusilier regiment has escaped few of those influences which are deemed pernicious to the health of the European soldier in a tropical climate; so that, irrespective of the importance of the specific question under consideration, the history of the regiment for that period may be deemed interesting, as exhibiting the changes to which a large body of European troops, performing the ordinary duties required of soldiers in India, and exposed to the various sources of sickness and mortality incident to men thus actively engaged, are liable.

With these remarks I now proceed to consider a few points more particularly bearing upon the subject I have undertaken.

In earlier times the condition of the European soldier in India was in many respects deplorable. Severed, perhaps at an early age, and, it may be, on account of some youthful and venial error, from all

who took an interest in, or could advise or direct him, and with all the happy recollections of his boyhood fresh in his mind, the finest feelings of his nature were doubtless soon chilled by intercourse with men who could little sympathize with him. With passions and bodily energies in full vigour; the idleness, the monotony, the restraint, and the necessary confinement of a barrack life, in an ungenial climate, were irksome in the extreme; whilst superior talents and mental faculties could only make him the more pine for joys irrecoverably forfeited. There were, then, few opportunities for mental improvement. Books were scarce, and newspapers, if procurable at all, were of old date, and little interesting. For a season or two after arrival, the earnestly inculcated injunctions of his friends, and his own faithful promises, to maintain a regular correspondence, may have been religiously observed; and the interchange of letters may for a while have cherished all his former associations, and kept alive the desire to revisit the scenes of his youth. But without any opportunity of renewing those ties, it is no easy matter, even among the better educated, to continue this regularity of correspondence during twenty years of exile, and at the distance of half the circumference of the globe. Consequently, by the gradual loss of correspondents, by the tardiness and uncertainty of communication, and by various other accidents, letters became less frequent, and old familiar faces and things began to be less distinctly remembered. At length other interests, other views, and other acquaintances springing up, the old associations ceased to be recollected. In many cases, without doubt, the spirit became broken at the dim prospect of ever revisiting those early scenes, at the despair of meeting those early friends, and at the disseverance of all connection with home. From the real or apparent forgetfulness of relations, the youth may have become indifferent to character and self-respect. He may have endeavoured to drown the recollection of former error, of blighted prospects, of home, and of relatives, in drunkenness and debauchery, which too often terminated in an untimely death. In those times, moreover, everything connected with India was imperfectly understood by the people at home; and more especially by the classes from which

recruits are usually obtained. Enlistment into the Honorable Company's army was then deemed equivalent to perpetual exile, or to a certain and early grave. It was too often the last desperate step of men of reckless characters, or of ruined fortunes. Mothers, and other relations, consequently looked with dread upon the Indian service, and the better classes of recruits were reluctant to enter it. The prejudices against it unfortunately were not without foundation. The soldier's condition was not then, as now, an object of watchful solicitude. He was worse paid, worse fed, worse clothed, and worse quartered. His rights were ill defined, and little understood. He was more at the mercy of those in authority over him. Punishments were capriciously inflicted. They were often very severe, and not unfrequently of a degrading nature. Parades and drills were long and harassing, and in many of their minutiæ irksome and pedantic (as indeed they are to this day). The services of European soldiers were much required in the field, and regiments and detachments, afloat as well as on land, had to perform severe duty, with a tolerable quantity of hard fighting ; whilst the men, ever brave, and ever ready to meet and conquer their country's foes, rejoiced in the excitement of active service. On such occasions their gallantry may have been acknowledged, but that was not held as a reason for pampering them with indulgences at the end of the campaign. They who in the tented field had become inured to the fatigues, privations, and asperities incident to military life, could not always calculate on a period of rest, or on being sent to an eligible station; but, being deemed seasoned soldiers, were expected to surrender superior accommodation, climate, and quarters, in favour of others less thoroughly acclimated. In those days the mortality amongst our troops could not be otherwise than excessive. It is to *such* times the documents quoted in Parliament evidently belong, and, as far as we can judge, the deductions from them were perfectly legitimate ; so that any comparison between the Honorable Company's European regiments and the Royal regiments of that period would most likely prove disadvantageous to the former. But Lord Ellenborough followed up his statements by arguments leading

to the impression that the extraordinary disparity brought so prominently to notice by him, with a consequent degree of inferiority on the part of the Honorable Company's European regiments, still exists. That such should have been His Lordship's impression is little to be wondered at, when we recollect that considerable misapprehension, ignorance, and prejudice regarding the Honorable Company's army prevail even at the present date; and that very much nearer home, and in quarters where there is little excuse for their existence. But times have changed. The Honorable Company's European regiments of those remote periods are about as much entitled to comparison with the army of the present day, as the sailing vessels, which, under the immortal Nelson, won the Battle of Trafalgar in October 1805, are to be compared to the steam fleet which manœuvred off Spithead in August 1853, in presence of Queen Victoria. For many years improvement has been progressive, and the condition of the Honorable Company's European soldier has almost yearly undergone amelioration. His own never-failing gallantry in action, his devotion, his courage, and his patient endurance of toil and privation; and probably, also, the greater experience of his superiors—their better acquaintance with his wants and privileges, and their own increased responsibility, have secured him justice, and contributed in every way to benefit him. The soldier's duty is now more regular; he is less harassed upon parade, and he is not treated as an unreasoning, brutalized being; severity is not now considered essential to discipline; youthful delinquencies and indiscretions are not now visited by awards less calculated to restrain vice than to convert the thoughtless and unwary into hardened and irreclaimable offenders; and hence there is no motive for the discreditable, unfair, and unmilitary practice of concealing crime. At the same time, however, the smallest dereliction of duty, or straightforward conduct, is at once checked by adequate punishments. Drill, duty, discipline, punishments, and the entire interior economy are reduced to a system, and do not depend upon the will or caprice of any one. The soldier is now better paid, better fed, better clothed, and better quartered,

(although in some of these particulars there is yet much room for improvement,) and with rare (but occasionally very glaring) exceptions, he has now the regular tour of the different stations of the Presidency. Commensurate with the additions to his comforts, has been the improvement of the habits of the soldier in the Honorable Company's European army; which, combined with the reputation of its glorious achievements in war, and the high prizes it holds out, have attracted to its standard a better class of recruits; so that men of great ability and intelligence, of respectable birth, of superior social position, and of excellent education, now muster strong in the ranks of every regiment; whilst sobriety is gradually taking the place of drunkenness, and sickness and mortality are yearly diminishing.

The establishment of steam communication has perhaps benefitted no class of men in a greater degree than the soldier. He can now keep up a frequent communication with his friends, and a tolerable acquaintance, not only with his own native district, but with all that is going on at home, and in European and other countries; and hence we find not a few who are well informed on all the leading topics of the day. Each European regiment of the Honorable Company's service (but of course I refer more particularly to the Fusiliers) is provided with a well managed savings' bank, a capital school, a well selected library, a printing press, a good coffee shop, and an excellent theatre; whilst those soldiers who are clever and expert workmen as tailors, shoe-makers, smiths, farriers, carpenters, book-binders, watchmakers, &c. meet with every encouragement. There are likewise provided for their amusement chess and cricket clubs, and a five's court built by Government, as well as skittles, quoits, and draughts-boards. The men play at "long-bullets," and are permitted to go out shooting, rowing, and fishing, at their discretion, or as opportunities offer. At this station (Aden) there is however no shooting, and little available ground for cricket, or for their favourite pastime "long-bullets." With a good library to resort to, with schools where he can qualify himself for promotion and higher employment, and with rational amusements, a soldier's intellectual energies need not now be wasted in dangerous

or hurtful inactivity, or his mind left to prey upon itself for want of occupation. Under their beneficial operations, our soldiers are as well behaved in quarters as they are brave before the enemy; and although during the last fifteen months irregularities and drunkenness have been far above the average, yet they are due to a mere temporary ebulition, easily accounted for, and which will gradually subside. Every regiment similarly situated acts in the same way. I am happy, however, to say, that notwithstanding these drawbacks, the deposits in the savings' bank have during the year increased from Rs. 17,700 to Rs. 20,700, whilst the ardent spirits consumed in the canteen have decreased by about two drams per man per diem, that is about one-half.

Improvements in the moral and physical condition of the soldier have progressed as knowledge dawned upon the authorities relative to his requirements. They ever evince the utmost solicitude to add to his comfort, and are unsparing in their endeavours to preserve his health, and whenever sanatory measures are proposed, they receive the readiest and most mature consideration. In adopting the most efficacious means of preventing disease among the European soldiery, expense is always a secondary consideration; but impediments have to be encountered. It unfortunately happens that the best suggestions are sometimes very tardily carried out, and the soldier's health is sacrificed to the scruples and procrastination of those who have no actual experience or practical knowledge, but to whom questions of almost vital importance are very frequently referred. As an instance of such procrastination, I may mention, that after the 1st Bombay Fusiliers captured Aden in January 1839, they were placed, as a temporary measure, and until suitable barracks could be erected, in tents covered with mats. In January 1853, *i. e.* after a lapse of fourteen years, the same regiment again marched into the same temporary buildings, whose walls are but 7 feet 7 inches high, and whose breadth is only 15 feet, which allows a space between the ends of each cot of scarcely 3 feet. These buildings are in every other way unaltered; except that they are so many years older, in much worse order, and much dirtier. To this day even a site for barracks at Aden has not

been fixed upon, and the probability seems to be, that at least five years more will elapse before the European troops at this station get such accommodation as they require. Still, however, in spite of much supineness and incapacity, a great advance has taken place in the improvement of the condition of the European soldier. Disease is to a considerable extent averted by the strictest attention to his personal economy. He is no longer encouraged, nor permitted, to eat and drink what is noxious; his diet is well regulated, and unwholesome bread and meat are not now imposed upon him by unscrupulous contractors, and passed by officers indifferent to his health and welfare; nor is he allowed to select for his daily rations cheap and unwholesome provisions in the bazaar. Under regulations well considered and rigidly enforced, his ration money is carefully expended; the best articles of diet are provided, and the surplus money returned to him. He is no longer compulsorily initiated into the destructive habit of dram-drinking; nor is he required to pour down his throat a quantity of ardent spirits every morning before breakfast; thus the more surely to induce thirst, and a longing for more spirits, to throw him into a state of fever, and ultimately to destroy the coats of the stomach, and to derange the action of the liver. He can still have two drams daily, beginning after twelve o'clock, but even these he is encouraged to relinquish in favour of coffee, and of sound malt liquor. By a late excellent order no recruit receives any ration dram until he is dismissed drill. Cleanliness, so necessary for the performance of the function of the skin, is rigidly enforced. Water-sheds are attached to every barrack for ordinary ablutions, and swimming baths are provided in convenient situations, by which the pores of the skin are still more effectually kept open and healthy. The soldier's bedding is an object of daily attention. His clothes are tolerably well-adapted to the season of the year, although not of a material suited to the climate, nor of a make admitting of the free use of the limbs and lungs; but, on the contrary, often hurtfully compressing the ribs and abdominal viscera, and affording a very inadequate protection to the person and to the head. The necessity of an ample

supply of fresh air to the lungs is now fully understood, and spacious, comfortable, airy, and substantial barracks, well calculated to counteract the effects of heat and climate, have been erected at some, and are in contemplation at other stations of the Army; whilst drainage and cleanliness in the vicinity of the barracks are strictly observed. Sanataria at different stations have been established, and at others experiments to test their utility have, under the authority of the Medical Board, been begun. Some of them have been established with very little regard to eligibility of position, or to any urgent necessity for them; and in some instances the zeal for sanataria has diverted attention from the requirements of regular cantonments: as for example at this station, where there is a capital sanatarium, which may be available for four months in the year for a few sick, whilst the regimental hospital, required every day in the year, is a most miserable and uncomfortable building. The desire is thus, however, equally evinced to benefit the soldier, although I think in a somewhat mistaken direction.

Sanataria.—My own experience of the sanataria already selected has not been extensive, and, as far as it enables me to give an opinion, has not been satisfactory. I fear the expectations entertained in some quarters regarding them may not be fully realized. In an official report on this subject, I stated that "improvement has been very partial, although in the selection of cases for the experiment we were much restricted"; and again, "the majority of these cases, I feel assured, would have derived much more benefit by being removed from the dry and elevated table-land of the Deccan to the sea side, than to still more elevated regions." The advantage of the healthy, bracing, pure air of hills for European troops is universally admitted, but chiefly for men in health. The vicissitudes of climate are too great and too sudden for the generality of invalids affected with the ordinary complaints, for whom a change is necessary. To those suffering from serious organic lesions these sanataria hold out no hope, and should be resorted to rather for the prevention than for the cure of disease. Perhaps, however, the experiments now in progress will enable us to discover the errors that should be avoided, and the sanataria

may turn out more beneficial than I anticipate. The chief desideratum will be to moderate the effects of vicissitudes of climate by good substantial barracks, well protected by proper doors and windows; and, indeed, until they *are* erected, no fair experiment can be instituted. Athough the general good health of European troops in the Deccan might improve by a still higher location, is not beyond the bounds of possibility, yet it is rather to those quartered in the seething climates of Bombay, or of Guzerat, that benefit from such a change may be expected. The day is not, I trust, far distant, when, aided by the railway, the European portion of the garrison of Bombay will be located in good barracks at Matheran, whilst Bombay itself, or some other place on the sea coast, will be the sanatarium for sickly men requiring a change. By such an arrangement, not only would the health of the men be preserved, but the temptations of Bombay would be avoided.

These subjects have already received much consideration, and very creditable progress has been made in carrying them into effect. But in a country where morbific agencies are everywhere in active operation; where the most formidable maladies unexpectedly and unaccountably make their appearance; where the European constitution is prone to derangement from very slight causes; where the progress of disease is rapid, and soon becomes uncontrollable; and where, consequently, no precaution should be neglected, and every source of disease most sedulously traced, and, if possible, removed, much remains to be done which the preservation of the soldier's health urgently requires. In nothing is reform and improvement so much demanded as in barrack accommodation.

Barracks.—Proper accommodation in barracks is a vital question to the soldier in India, but it is only at some of the newest stations (as Hydrabad and Kurrachee) that barracks on the most improved principles have been erected. At all the old stations (as Bombay, Colaba, Poona, and Kirkee) they fall sadly short of what it is now universally admitted barracks for European soldiers should really be. For a regiment of the strength at which Royal regiments serving in the colonies, and the Honorable Company's

European regiments, are now kept, 24 barrack rooms are required, unless other arrangements are made for the serjeants' mess, canteen, library, school-room, &c. If, however, the occupants of each pendal are limited to twenty-five, as has been recommended, of course a corresponding additional number of barrack-rooms would be needed; but I am not aware of any very valid reason for their being thus restricted. In most parts of the Bombay Presidency a western aspect is the best, but at Aden, the sea breeze being from the east, the barracks should face in that direction. I consider it indispensable that the floor of each pendal should be raised at least three, four, or more feet, or that it should be on arches, according to the site, whether high and dry, or low and damp. To preserve the compactness of a camp, the barracks are generally in lines of six or eight, one behind the other; but in echellon, for the sake of ventilation, with a space of 150 feet between the ends of every two pendals, and of at least 100 feet between each line. Each of the twenty-four pendals should be at least 120 feet long, (exclusive of the end rooms, which are usually occupied by non-commissioned officers,) 24 or 25 feet wide, and 22 or 24 high, with four doors and eighteen or twenty windows. Each door should be $8\frac{1}{2}$ feet by $5\frac{1}{2}$ feet; each window 7 feet by $4\frac{1}{2}$ or 5 feet, and about $3\frac{1}{2}$ feet from the floor. There should be a verandah all round, at least 12 or 13 feet wide, open on the sheltered side, but enclosed with venetians and glass windows and doors on the weather side; and, to permit of air, holes should be placed near the top of the walls. The roof of the verandah should not be a continuation of the roof of the barracks, but should join on the wall about 4 feet below it. Ventilation should, moreover, be assisted by ventilators along the ridge of the roof, and for this purpose, the metal cowls are a great improvement on the old ventilators, which at certain seasons were of no utility at all, as they had to be matted up to keep out the rain. It is deserving of consideration whether such large buildings should not be protected by lightning conductors. Hanging shelves in each barrack, made of iron bars, and suspended from the beam, and running the whole length of the room, are a great convenience; on them the men keep a good

deal of their kit, which is thus well preserved from vermin, &c. and the room below has a much more neat and clean appearance.

The above dimensions are ample for a barrack, but a greater altitude of wall has been recommended. The air in the lower part of a barrack room is constantly renewed from the open doors and windows, and is kept in a constant state of agitation by men moving about, but unless attention is paid to ventilation above, contaminated air might accumulate near the roof of a very high building, and prove deleterious to, without being suspected by, the inmates. A good roof, and 16 or 18 feet of air (kept from stagnating by punkahs, and cooled by tatties between it and a man's head) are sufficient, in my opinion, and with 12 or 1,500 cubic inches of air to respire, he will I think in most situations have air enough, without any adventitious improvements, which, to say the least, are not required. But I may here mention having seen refinement in ventilation carried so far that it has been assisted by gutters opening under the wall outside, and near the centre of the floor inside. They are capital receptacles for all sorts of filth, with which they are soon filled up. Dead rats and such like form a subject of constant complaint by the men, who are at times overpowered by the noisome effluvia arising from them. How any one could have imagined that wholesome air could be procured through a channel of this sort is unaccountable. A better way of filling a barrack with foul and fœtid stinks could not have been devised. The barrack floors should always be flagged. No material but stone will stand the thick iron-heeled shoe of the soldier: mohrum and chunam are soon broken up, and quickly get out of repair, and to keep such a floor neat and comfortable is quite impossible. A double tiled roof is the best, and the walls, made of brick or stone, and lime, should be of tolerable thickness. Glass windows are indispensable against rain, dust, and sudden changes of wind. Badly fitting doors and windows, thin walls, and thin and low roofs, are fruitful sources of disease, because, instead of tempering the climate, of equalizing the heat of the different seasons, and of bringing the temperature to the mean of the locality, they allow

it to partake of every oscillation of the thermometer, and all climatic influences; so that each room is too cold in the cold weather, and insufferably hot when coolness is required. For these reasons no soldier can sleep in his barrack in the hot weather at Aden, and as regularly as the sun goes down he spreads his bed in the open air, of course exposed to every change of weather. In the cold weather, on the contrary, he requires all the clothing he can muster to keep him warm. In these miserable hovels during last hot weather the thermometer stood at 103°, whilst in a common Native building with good walls and roof it never rose above 95°.

Out-buildings.—In connection with barracks, the proper position and construction of water sheds and urinaries is a subject of no small interest. If they are situated at a considerable distance from the barracks, exposure in going to and returning from them takes place; or their use is altogether dispensed with, particularly at night, when petty nuisances can be committed without detection. Separate buildings for them are therefore objectionable. On the other hand, if placed too near the barracks, they may generate offensive smells, and have an untidy appearance; still I think the reasons preponderate for having them near and convenient. The best places are at the corners of the barracks, the entrances to them being from the front and rear verandahs. If these buildings are substantially constructed, very little management is required to keep them pure and free from smells. The water sheds and urinaries should be distinct from each other, and the latter on the lea side of the barrack. At each corner outside there ought to be a cesspool, with drains from the sheds; unless where an abundant supply of water is available, and a thorough system of draining can be established to carry off all moisture clear of the lines. Cleanliness and drainage are still too little attended to, and representations on these subjects are not always listened to, and sometimes, I think, not quite understood. There are still many barracks furnished with only one small room in the corner of a narrow verandah,—a very serious defect. I have known water casks, in which men were expected to perform their ablutions, being stowed into such a room; and,

incredible as it may appear, iron vessels to receive urine stood side by side with casks holding the water they were to drink. As might have been expected, the room was wet, and uncomfortable in the extreme; fœtid ammoniacal odours abounded, which strongly impregnated the drinking water, and formed a reasonable cause of complaint. That one small confined apartment could be expected to answer even for the purposes of a washing room showed that those who planned it were little acquainted with the matter. When a parade bugle sounds, it happens, perhaps, that 30 individuals rush simultaneously into such a room for a basin of water: ingress and egress is of course slow; few can wash in so confined a space; and hence the larger number are obliged to perform their ablutions in the verandahs, and in this way the mud floors become a foul and sloppy mire.

Patcherries.—But imperfect and uncomfortable as too many of the barracks undoubtedly are, the occupants (single men) are infinitely better off than the married people. The patcherries, placed on each flank of a range of barracks, are too often most mean, uncomfortable, and unseemly appendages. Whatever is the amount of consideration shown for the health and comfort of unmarried soldiers as regards barrack accommodation, it is, generally speaking, extended to a very limited degree to the married men and their families; and the high rates of mortality which everywhere prevail amongst the women and children of a regiment are in some measure to be attributed to this cause. In the improved barracks lately erected, or now in course of erection, I presume the cost of accommodation for each soldier is not under Rs. 400, but Rs. 20 is all that is allowed to each married man, which, even by assistance from the regimental fund, fails to make him comfortable. They consequently occupy small, confined, miserable huts; the walls of rough stone, or mud, and the roof of indifferent chupper, which very inadequately protects them and their families from the weather. These huts are, indeed, so ill built, that it is no unusual thing to see parts of the walls give way at the beginning of each monsoon, and thus they are scarcely safe to live in. They are so confined, that a man with children has barely space either to move

about, or to lie down. They are so low, that to heighten them the floors have to be dug out, and thus the rain which falls from the eaves soaks in, and oozes up through the low mud floor; and not only makes everything inside wet and damp, but endangers the health of the inmates; whilst, again, at other seasons the hut is so close and hot as to be scarcely habitable. The health and comfort of the married men and their families urgently require that they should receive a greater amount of consideration, and that habitations more nearly corresponding with those of the unmarried soldier should be erected for them. I might add that mere uniformity of appearance demands that barracks in conformity with the other barracks, but properly sub-divided for decency's sake, with at least two rooms for each family, should take the place of thatched huts.

It will be seen by the table on another page that the mortality amongst the women is as high nearly as 6 per cent., and amongst the children nearly 7 per cent.; it seems probable, I think, that much of this high rate of mortality may be ascribed to the indifferent manner in which they are protected from the elements.

Hospital.—The hospital should be well raised, placed on one flank, or in rear, in an open, dry position, and facing the prevailing breeze. Three sides of a square is a convenient form. The centre face should be divided into two by a passage leading into the surgery in the rear, and thus form two wards, each of which should be 75 feet by 24. The number of doors in each ward should be four, one at each end, and one in the front and at the rear. There should be about 10 windows. The doors should be 8 feet 6 inches by 5 feet 6 inches each, and the windows 7 feet by $4\frac{1}{2}$ or 5 feet, and the sill 3 feet 6 inches from the floor. At right angles to the front face, and thrown forward, there should be two wards as wings, each 75 feet by 24, with two side doors, and 18 windows in each. The height of the walls, the form of the roof, and the width of the verandahs, should be the same as the barracks. There should be a close verandah with glass doors and windows running round the inner face of the square. The centre wards should have a close verandah in rear, to be divided into store-rooms, dispensary, surgery, &c.;

but for the rear of the wing wards, an open verandah is sufficient. The front of the square should be closed by a low wall, surmounted by an iron railing, and at the gate there should be rooms for the guard and Hospital Serjeant. In the rear there should be small separate apartments for eye cases, and mental disorders, bathing and washing rooms, necessaries, store-rooms, cook-rooms, &c. and outside of all the straw-house and dead-house. On each flank there should be houses for the Apothecary and for the Steward. The female hospital should of course be apart from the other, in length about 45 or 50 feet by 24, with a wide verandah enclosed with glass doors and windows in front, and closed and sub-divided into convenient compartments in the rear.

Cells.—With one accord people look upon the cells, necessarily attached to every European cantonment, as undeserving of a share in any other improvements suggested or undertaken, and, consequently, we may go on recommending alterations for an age without being listened to. The cells are unfortunately very often occupied, however, and not unfrequently by men suffering from the effects of previous debauchery and the depressing passions, who are thus much predisposed to disease, and therefore they ought not to be considered altogether unimportant. They generally stand at a short distance from the pendals, and apart one from the other, so as to prevent all communication between prisoners, as well as for the sake of free ventilation. They are constructed with small grated windows above a man's height from the ground, and with a double door, one of iron bars, the other of wood, and both made very strong. To admit fresh air, and to avoid closeness and oppression, the wooden door is generally left open, except in the cold season. Each building has a slightly overhanging roof, no verandah; but so that the walls being unprotected from the sun, the heat in such small apartments becomes every afternoon almost insupportable. Not only should there be a verandah, but its floor should be raised to a level with that of the cell, so as to form a platform on which prisoners could take exercise, and sentries be sheltered from the sun or rain, and from the damp of the wet ground. Everything likely to intercept the free ingress of fresh air, as enclosures or

dead walls, ought, however, to be most sedulously avoided. Enclosures create a stagnant atmosphere, which when heated is not only most oppressive to the feelings, but pernicious to the health. Unfortunately, however, prisoners and culprits are thought deserving of but little sympathy or indulgence, and measures to ameliorate the miseries of their lot are rather repudiated than otherwise. This cannot be looked upon as a correct view of the question, however, for no punishment is supposed to have an injurious effect on a man's health; and if cells in which punishments are carried out are productive of such grave consequences, they are not in a proper state. The punishment to which a man is sentenced is considered to be commensurate with the crime he has committed; and while the law requires satisfaction for its injured rights, to exact more is unjust. Nothing beyond the punishment awarded ought to be inflicted, but if a man's health suffer from the way it is carried out, he in the first place undergoes a severer punishment than he was sentenced to, and ultimately, by going into hospital, evades it altogether; and in this way the ends of justice are doubly defeated. On one occasion it was deemed necessary to keep a cell-prisoner, who it was understood intended to commit suicide, under the eye of a sentry, who, worse off than the prisoner, stood exposed to the direct rays of the sun by day and to the damp and cold at night, and thus ran the risk of losing his health in the discharge of his duty. A verandah and a raised platform round the cell would have effectually protected both prisoner and sentry. I may here remark that long periods of imprisonment in India are of very questionable utility, for many a man's health has been destroyed by such punishment. Even when the species of punishment was carried out partly in the cells, and partly or altogether in the guard-room, the effects on the constitution of a protracted confinement were most injurious, but now that all imprisonment is directed to be undergone in the cells, every precaution should be taken to preserve the health of the prisoners, and courts martial will do well to substitute other punishments, as much as possible, for imprisonment. An improved system of prison discipline is one of the boasts of the age; so that not only are the health and security, but the moral

improvement, of prisoners better attended to than formerly. The most hardened offender who enters a jail has now an opportunity of returning to society at the end of his period of confinement an altered and a better man. All civil prisoners have the means of reforming and making amends for past errors, but the military prisoner has no such opportunity. From the day he enters his cell to the day he regains his liberty, measures are taken for the security of his person, and for the preservation of his health. It is also seen that the punishment is carried out as awarded, and he is likewise deprived of indulgences of tobacco or grog, or much variety of food, but no attempts are made to improve his moral character. Even books are not allowed him, except the Bible and Prayer Book, which I fear are not much read. In utter idleness, he is left to brood over his misfortunes, and too often leaves the place of confinement not a reformed and penitent individual, but a callous and corrupted character.

Cook-rooms.—The cook-rooms attached to European barracks are faulty in the extreme : they have none of the conveniences for cooking, are far too small and close, and are so constructed that instead of the smoke finding a free and ready exit, it disseminates itself throughout the room, and thus not only half blinds the cooks, but renders every attempt at supervision utterly abortive. The cooking is thus liable to be conducted in a slovenly and dirty manner, and good and otherwise wholesome rations may be converted into a filthy and unpalateable mess, for which, however, it would be a hardship to hold the cooks responsible.

Privies.—The privies are a necessary evil ; they cannot be removed to an inconvenient distance, and wherever situated must be a source of annoyance, and at times something worse, to those in their vicinity ; but the deodorizing effects of lime, salt, sulphur, and charcoal are now fully understood, and I need only quote in regard to their use a few words from my report to the Medical Board :—"Quicklime and other deodorizing agents have been constantly in use in the privies, and with the most satisfactory results" ; and again—"The experiments were very satisfactory, as almost immediately an improvement in the state

of the privies was perceptible ; the ammoniacal effluvia from the urine pots was in a great measure neutralized, and all offensive smells, if not entirely removed, were materially reduced. From experience of the deodorizing effects of lime, I am of opinion that it might be used in every hospital privy, and indeed in every privy, with decided utility, so that I hope the Medical Board will sanction its universal employment."

Baths.—I have mentioned that plunge baths have been erected at some stations, and recommended to be put up at others. It is a pity they are so constructed that instead of being generally useful, they are of the least possible benefit. One which cost a large sum of money was so small that for a single company it would have been insufficient, even had there been an adequate supply of water. It was a heavy, dark, sombre, and repulsive sort of place, likely to be sought out by some wretched being tired of existence ; instead of being light, open, airy, and inviting to recreation and cleanliness.

Tents.—In the field the accommodation of the European soldier is very fair. Rowties are now seldom seen except for small guards or night picquets, and the large double-poled tents, with high walls and double flies, are a good protection in all weathers. Sometimes they are so constructed that each fly ends at, and joins to, the top of the wall, which is a mistake, for the outer one ought always to project considerably, so as to protect the walls from the sun, but more especially to convey rain clear of them.

Ship-board.—My further experience of the accommodation for troops on board ship has not altered the opinion I formerly laid before the Society on this head. The crowding, the discomfort, the absolute misery of soldiers afloat, exceed belief, and loudly call for improvement. In the voyage of the Fusiliers to Aden the only place in the steamers where the men could spread their bedding was on the top of boxes, gun carriages, &c. They were expected to occupy the middle part of the vessel ; but a constant stream of dirty water or spray, and high waves washing over the decks, made it impossible for them to sleep there, and some of them had not a good night's rest during the voyage. The baggage was reduced to one-third of the quantity allowed

by the regulations to be embarked with troops, yet notwithstanding this reduction, the men were put to the greatest inconvenience and discomfort for want of proper space.

Dress.—Next to barrack accommodation, no subject is deserving of more consideration than the dress of the European soldier in India. I have said that it has undergone gradual improvement, and such is generally admitted to be the case; nevertheless, much remains to be done. Improvement is slow, and indeed the pertinacity with which people adhere to old habits is nowhere more remarkable than in the manner of dressing the European soldier in the torrid zone. The effects of the enervating sun in a tropical climate should be counteracted by appropriate clothing; but the soldier in India is belted and clothed like the soldier in Europe, and consequently in a manner calculated not only to make duty irksome to him, but to be prejudicial to his health and comfort. He must still dress in the cloth coat of a northern climate, in trowsers fit for a Siberian campaign, and wear a hat that protects the head from neither heat nor cold. Efficiency is sacrificed to appearance, and soldiers serving in latitudes having a mean annual temperature of 50° above zero, and in countries with a mean annual temperature of 50° above freezing point (that is of more than double the number of degrees of Fahrenheit above freezing-point) are dressed alike. Surely this is taxing the wonderful capacity of 'man adapting himself to all climates' to *too* great an extent. Lord Hardinge, in his evidence, stated that he considered the dress of the European soldier in India as "most imperfect." Sir C. Napier did not harass the troops in Scinde by unnecessarily putting them in "full dress"; he wished the soldier to be always ready to go into action, and to appear on parade in fighting trim; but he did not consider "full dress" prepared the soldier best for either. I repeat, then, that next to barrack accommodation, there is perhaps no subject which calls so loudly for speedy reformation and improvement as the dress of the European soldier. The emigrant from Europe, be he missionary or merchant, settler or traveller, governor or judge, no sooner finds himself under a tropical sun, than he relinquishes the vestures of higher latitudes, and adopts

clothing of a lighter texture and looser make, and does not resume his former garb till he again turns his face towards the land of his nativity. With the most striking unanimity, all who are able to consult their own feelings adopt a costume calculated as much as possible to moderate the effects of increased temperature; and custom has introduced, and authority has sanctioned, one of comparative comfort. An officer can dine at "mess" in a light, loose, white, round cotton jacket, white waistcoat and trowsers; and can appear abroad on all ordinary occasions in apparel almost equally light and loose, with a hat to correspond. Such a dress is adapted to the temperature of the country in which his lot is cast, and accordingly all residents in India adopt it, or one similar. Common sense, the commonest feelings, nature herself, all point out the necessity of the alteration, whilst dearly bought experience has amply proved that it cannot be neglected with impunity. If, then, it is found after long experience that such a costume is requisite for people pursuing avocations requiring little personal exertions, and which seldon lead to exposure in the open air, how much more necessary must a similar description of dress be for men loaded with a musket and heavy accoutrements, under a mid-day tropical sun. In the face of experience, however, and opposed to common sense, with the most strange and unaccountable obstinacy, the poor soldier, who has no option, is still doomed in India to be clothed as if he were in Europe. Every one will admit that to preserve the ideas, the views, the associations, the pride, and the appearance of the British soldier must be a paramount object; but that any of these would be lost by adopting a style of dress better suited to this climate may fairly be questioned; whereas there can be no doubt that the soldier's comfort, his efficiency, and his health, are now sacrificed by dressing him in a manner unsuited to the climate he is required to serve in. The present "full dress" is not adapted for this country, and the sooner it is altered, or entirely abolished, the better. The stiff hard stock has happily been done away with; and the cumbrous chaco, with its heavy metal ornaments, has been at home, as in this country, almost as universally condemned, so that it is hoped it will soon share the

fate of the stock. Lord Hardinge, in his evidence before the Parliamentary Committee on Indian affairs, related that the men of H. M.'s 9th regiment, in the second Affghan campaign, "marched and fought in their forage caps, through the Khybur Pass to Cabool, and back again from Cabool to India, having carried their European chacos on camels the whole distance up to Cabool and back again at great expense and inconvenience"; and his Lordship seemed to adjudge great credit to the gallant regiment for having done so. The zeal and devotion thus evinced were most creditable; but it appears not a little extraordinary that this gallant corps should have been put to such a shift. When the 1st Bombay Fusiliers went on field service in 1848, all the chacos and full dress coats were left behind, and every man marched and fought at Mooltan, and through the Punjaub to Peshawur, and back again to India, in forage caps and shell jackets. Each one would have heartily rejoiced had he been permitted to continue a dress which becomes a well-shaped soldier, and in which he knew by experience that he could properly perform every species of duty. But such an indulgence could not be allowed; and the rats, in his absence, having damaged or destroyed the old full dresses and chacos, each man had to reprovide, and incommode himself with these expensive and useless articles. If marching and fighting without chacos be an improvement, as it has been acknowledged, why is such a head-dress not entirely discarded? But even so late as the last Burmese campaign, some European regiments (if we may trust the accounts in the papers) went into action in full dress, and in consequence of such infatuation, these corps lost almost as many lives by *coup-de-soleil* as by the fire of the enemy. The helmet which has been proposed—if anything besides the forage cap with white cover is required—will be a great improvement. The red frock coat, which is spoken of at home as a substitute for the present full dress coatee, will also be a great improvement, and if made loose, will allow of the free use of the muscles of the upper extremities, and a free expansion of the chest, which the present coatee does not. It

will also, no doubt, be denuded of many useless ornaments, which add so much to the weight, as well as of the fantastic shoulder appendages, which increase the inconvenience of the present one, and so effectually prevent the soldier, whilst incased in it, from lying down, or attempting to take rest in the recumbent position. That the new pattern, with all its improvements, will answer in this country, seems problematical. The quantity of material and its weight (if made of such cloth as is now in use) will be insuperable objections. Why the cloth trowsers are retained as part of the soldier's dress is inexplicable. No soldier can march in them, they are not worn on parade, and indeed they are not worn above six times a year at all, and could well be dispensed with. A cloth of a much cooler and lighter description, such as serge, could easily be procured for use in India both for coats and trowsers, and should be substituted.

To the loose, light, cool, and comfortable clothing adopted by all residents in hot climates, the present undress of the soldier makes perhaps as near an approach as is compatible with the preservation of the national military costume, and fortunately it is suited for all occasions of duty, drill, exercise, fatigue duties, night duties, fighting, marching, parade, or guard duties. The forage cap, such as it ought to be in India, with a wide well-stuffed crown, a good-sized projecting peak, and with a white padded cover to protect the head and eyes,—instead of a scanty affair that fits the head like a night-cap, and affords no protection either to the head or eyes,—is at all times an excellent head-dress. A man's loins in this country do not require the protection they derive at home from long-tailed coats, and therefore the shell jacket, coming well over the top of the trowsers, is sufficient for every purpose. Wings and epaulettes are great incumbrances, and are discarded on service as useless, but a cord on the shoulder is not much in the way. Although a highly celebrated authority considered one coat or jacket enough for any man,—and he never had more than one himself,—yet, for great occasions, a shell jacket might be devised far better calculated to show to advantage the well-made and well-set up soldier, than the present full dress coatee; and it could be made equally hand-

some, whilst it would be lighter and more comfortable. When more warmth is required, as on night duties, the great coat is worn, and it is sufficient at all times to give protection from the weather. To the common blue barrack changes there is scarcely an objection, but it would be desirable if the dye was *fixed*, as it now soils the skin, and obstructs its pores to a pernicious degree. This ought to be remedied, as no article of dress is in such constant wear both in and out of barracks, when off or on duty. In shaping the trowsers, an absurd custom has crept in, of having them tight over the buttocks, and of the same width from the hip to the instep—just as if a man had the same quantity of fat and muscle on his ancles as on his thighs. Such trowsers must either be as wide as a petticoat over the instep, or pinch a man of tolerable size over the hips, make him hot and uncomfortable about the fork, and confine his stride, and every motion of his body. A man could not march half the distance in such trowsers, as in a pair properly made. On this part of the soldier's dress I need not further dilate, as my views are already before the Society (vide Transactions Vol. X. page 136).

Accoutrements.—The soldier's belts and pouch have long been complained of, on account of their confining the chest, and their great weight. I have seen men on duty in the hot weather at Aden sweating through every article of dress, although twice changed; the perspiration not only staining, but saturating, the belts. At such times these articles should be taken off, except by the sentry on duty, because the exhaustion which follows, and the chance of sickness from clothes saturated with moisture, ought, if possible, to be guarded against. Much relief will accrue from the recently sanctioned small pouch on the waist belt, to hold 10 or 12 cartridges, with a sliding frog for the bayonet; but in very hot weather these will be found oppressive, and when a man is lying down ought to be laid aside. No article of the soldier's appointments has been so much vilified, and, as far as I can judge, unfairly, as the *knapsack*. Perhaps for the soldier at home something much more suitable might be devised, but in this country, where a knapsack never goes on any back but a camel's, it can signify little what its

shape, size, or make may be, provided it protects the kit packed in it.

Rations.—The efforts made to improve the dietary of the soldier for a number of years past have been attended with greater success than those made to reform and improve his dress or barrack accommodation. Accordingly, the men's ordinary rations, and their scale of diet when in hospital, have arrived at a high degree of perfection, and indeed are considered superior to those of the soldier at home. The ingredients intended for their consumption are not only wholesome and nourishing, but of superior quality; and they are issued under such safeguards, that attempts at deception are almost impossible; whilst the variety of articles allowed for the sick in hospital is most ample, and appropriate for every stage of disease and convalescence.

The rations for the soldier in health are nearly uniform throughout the year. Up to a late period they consisted of 1 lb. of meat, 1 lb. of bread, 4 ozs. of rice, 2 ozs. of salt, 1 oz. and $\frac{2}{7}$th of sugar, and 3 lbs. firewood per man for cooking. Complaints having been received, however, at various times regarding this scale of diet, and suggestions made regarding it, the regimental authorities, and medical officers of European regiments were, about two years ago, called upon to suggest any improvements of the rations of men in barracks, as well as of the hospital diet, that might occur to them. In the recommendations sent in from the different regiments much unanimity prevailed, and about six months ago new regulations were promulgated, sanctioning alterations that had been suggested, and granting almost all that was required. The chief defect of the old rations was the absence of vegetables, which has now been remedied. The quantity of salt, out of all proportion large, has been reduced; and the quantity of sugar, unnecessarily small, has been increased. Eight ounces of vegetables (potatoes if possible) are issued daily to each man. At certain seasons, and in certain places, 1 lb. would have been better, and milk should have formed part of the daily rations. Rice has been nearly expunged from the hospital diets, and is unnecessarily retained in the barrack rations, for it is seldom touched, and by a mutual understanding is disposed of

to the cooks, who, in lieu of it, provide a litttle seasoning, &c. Breakfast is served at 8 o'clock, dinner at noon, and supper, as it is called, at 4 P. M. Breakfast consists of tea and bread, with, generally, a small portion of meat (or fish, chops, eggs, some milk and butter, provided by the soldier himself). Dinner consists of the remaining portion of meat, bread, and vegetables. For supper there is again tea, with any balance of bread that has been left from dinner, or probably some extra bread is provided by himself. The butcher's meat is seldom many hours old, as the animals are slaughtered over night, and the bread is received fresh from the bakery every morning. The meat is either beef or mutton, the former served out five times, and the latter twice a week. It is left to the discretion of the Commissariat to serve out coffee instead of tea, under certain circumstances. On the march up the Indus the quantity of meat per man was increased by half a pound, owing to its inferior quality; and at Aden, for the same reason, the daily issue has always been a pound and a half per man. About the end of the hot season, when all animals are lean, complaints of the poverty of the meat and of its small weight are frequent, but to obviate these, the new scale directs the meat to be divested of the large bones. The quality of the bread is directed to be equal to that supplied to hospitals, viz. of the "*first sort*," and all other articles are to be good and wholesome. Should there be any doubt regarding the quality of the articles supplied, the Orderly Corporals bring the subject to the notice of the Orderly Officer, who reports the circumstance. One medical and two military officers then assemble as a committee, and examine and report upon the rations. I have never known but upon one occasion provisions passed by a committee rejected afterwards by the men. So much attention is paid to the Commissariat supplies, so positive are the orders regarding them carried out, and so strictly is supervision exercised, that deception on the part of the contractors is almost impossible, and hence complaints are rare. Sometimes, however, they arise, but only upon strong reasons, and perhaps not till after the rations have been for several days in succession objectionable. The men are restrained from complaining by

the inconvenience and expense they are put to, whenever the rations are condemned. Delay is inevitable; hours elapse before a fresh supply can be obtained, which, also, may be found to be of inferior quality, and of course in the interim they get nothing to eat. When the bread is condemned, biscuit is substituted. This, however, the men rarely touch, and generally give it away. They would, indeed, prefer rather to eat the condemned bread than the biscuit. On such occasions, they trust to purchasing some bread from the bazar, but should none be procurable, they either fast, or eat whatever trash they can get hold of. The introduction of vegetables into the rations is a great improvement; and it is to be hoped that wherever European troops are stationed, efforts will be made to secure daily supplies of potatoes. Since the arrival of the Fusiliers at Aden, 8 oz. of potatoes have been issued daily to each man upon my monthly recommendation, but as they are now included in the rations, this will no longer be necessary, except for the few who prefer compensation to their rations—an indulgence to which only Serjeants and married people are entitled. Potatoes are very digestible, and powerfully anti-scorbutic, which in a place like Aden is of great importance. From old habit, soldiers prefer potatoes to any other kind of vegetable. When they are not procurable, cauliflowers, cabbages, carrots, &c. may be used, but to recommend the two former being supplied here would be useless, as they could scarcely ever arrive in a wholesome state, or if so, would quickly spoil, and hence fresh country vegetables are preferable. When mutton and beef are of the same price, as they frequently are at this station, the soldier should be allowed the option of having them on alternate days, although I am by no means certain he would prefer it for a continuance, as there is a common idea that mutton is less substantial than beef. The manner of cooking is left to each mess, but if barley was substituted for rice on certain days, it would allow broth to be made—a wholesome variety, particularly in hot weather, when men are thirsty.

It has been supposed that a strict adherence to a particular diet must tend to pall the appetite, in time to injure digestion, and eventually to affect the health; consequently, it has been recom-

mended to vary it by the more frequent substitution of mutton, fish, fowls, &c. Some consider the quantity of animal food excessive, and over-stimulating to the system, and they would reduce it, allowing additional farinaceous matter, &c., and thus to assimilate the rations more to the mode of living among the Natives. The substitution of mutton for beef, at a place like Aden, might be permitted, so long as approved of by the recipients; but fish, although liked as an extra, would not alone be considered sufficient for a meal, and fowls could not be procured in sufficient numbers, or at a moderate price. I am by no means satisfied that a spare diet is best suited to the European constitution in India; on the contrary, I believe a generous diet, if excesses are avoided, is the best; but admitting that the present ordinary rations are over-stimulating, and that it would be of advantage to imitate somewhat more the customs of the Natives with respect to diet, are we to expect that hungry, growing youths would be influenced by such arguments? Soldiers are rarely so observant of hygienic rules as this would imply; and if the alteration was made, and "*Banian days*," or days of vegetable diet, established, which it is well known never hitherto succeeded, the motive would probably be misconstrued, dissatisfaction would be created, and by obtaining less wholesome articles from the bazar the attempt would be rendered nugatory.

Water Supply.—In connection with the soldier's rations, the supply of pure fresh water rarely requires to be considered, as it is generally unlimited. Aden, however, offers an exception. On arrival of the regiment at this station, each man was allowed one gallon of fresh, and two gallons of brackish water per diem; and in order to prevent scurvy, a quantity of lime-juice, sugar, and pickles were issued monthly upon the requisition of the medical officer. I had not much confidence in the efficacy of the arrangement as a hygienic measure, and thought that not only scurvy, but other diseases also might be prevented by much simpler and more intelligible means. It appeared to me, that the primary object was to assist the digestion of a wholesome meal by wholesome drink, or at all events not to render it unwholesome by drinking impure water. I considered, that unless there was

a sufficiency of good fresh water, however wholesome the diet might be, it would not be properly digested, even with the assistance of pickles, lime-juice, and sugar; and that good food might even be rendered indigestible by being cooked in brackish water, and that while blindly depending upon untrustworthy prophylactics, the seeds of disease might be laid. I moreover considered, that unless good drinkable water was supplied, less wholesome beverages would be had recourse to. I accordingly represented these views to the Medical Board, and recommended that pickles, sugar, and lime-juice should be altogether dispensed with, and that, as the best preventive of scurvy, an allowance of potatoes should be granted, and 3 gallons of good fresh water should be supplied to each man daily. The Medical Board at once sanctioned my suggestions, which have been since duly acted upon. The result is that only two cases of scurvy have appeared, and both in men (volunteers from the 2nd European regiment) who had suffered before from the disease at Aden.

The advantages which have accrued to the soldier's health and morals by the substitution of sound malt liquor for ardent spirits are already very perceptible in the diminution of crime, sickness, and mortality. It would be very desirable if the "liver-burning" ardent spirits were forbidden to be issued, and especially to be drank in the undiluted or "neat" state. Porter, beer, wine, and spirits and water, are quite a sufficient variety, although the highly pernicious morning dram allowed upon the line of march is greatly prized by the men; but a cup of coffee is not only equally refreshing, but much more wholesome. An abundant allowance of malt liquor is of paramount importance, and it is to be hoped no consideration will be permitted to interfere with its regular supply, as upon its failure, from any cause, dram-drinking is again resorted to.

Canteens.—Regimental canteens are generally constructed too small; they are often not kept sufficiently clean, and the atmosphere is rendered offensive by the exhalations of a crowd of men, by the effluvia of spilt liquor of various sorts, and by the fumes of tobacco, &c. Far more space should be allowed, in order that the men might not be crowded, but drink their liquor

leisurely, and not gulp it down, as at present. Thus, not only would confusion be avoided, but cleanliness would be ensured.

Hospital Diet.—There are five different kinds of diet for the sick in hospital. The first approaches the barrack rations in quantity and in quality, and is intended for men in a state of convalescence: it is not much required. The others are adapted to the different degrees and kinds of sickness. Each is ample, and sufficiently varied, whilst the greatest latitude is given to medical officers in ordering "extras," which include everything that sick men can possibly require. The selection from so many kinds of diet gives rise sometimes to grumbling by a patient, and occasions some trouble to the young medical officer. My rule is to place every man, on admission, upon "*spoon diet*," to continue it, or alter it, as circumstances call for, and to make such changes as are from time to time required. A reasonable request is never unattended to, but increased appetite, resulting from improving health, is not met by an allowance of "*extras*," but by substituting a better scale of diet. I seldom allow "*extras*" except in severe cases of sickness, when the appetite is languid and fickle. Beef seldom enters into the hospital diet, but mutton and fowls form the usual meat ration. Supplies of all sorts, including wine, beer, and spirits, are ordered to be the best procurable. The expenditure of these latter articles during the last three years will be seen by the following table:—

Expenditure of Wine, Beer, and Spirits, in the Hospital of the 1st Fusiliers, for the Years 1851, 1852, *and* 1853.

Years.....	1851.	1852.	1853.
Strength of the Regiment ..	1,071	913	513
Arrack .. .. .. Bottles	..	..	3
Beer.. .. .. .. „	861	668	325
Brandy .. .. .. „	48	84	25
Gin .. .. „	..	1	1
Port Wine .. .. „	89	120	45
Sherry Wine .. .. „	54	14	21

The ordinary deduction from a soldier's pay, of whatever rank, on account of rations, is 3 annas 4 pies per diem, or Rs. 6-5-4 per mensem. When provisions are cheap, and the cost of them does not amount to that sum, the balance is returned. In hospital a further deduction of 3 annas per diem for Serjeants, Corporals, and Drummers, 2 annas for privates, and 1 anna for boys and women, is made under the head of "Hospital Stoppages." Soldiers suffering from wounds or injuries received in action, or on duty, are exempt from payment, and children are dieted in hospital gratis. Notwithstanding these deductions, a man for a long time upon the sick list has a large balance of pay to receive when he returns to duty. Probably nothing is more conducive to the reproduction of disease than this mode of adjustment. The balance of pay is early got hold of, and too frequently spent in a heedless, and, unfortunately, not always in a harmless manner, before the constitution has sufficiently recovered. If, instead of the present mode, the arrears of pay thus due were lodged in the Government Savings' Bank, I have no doubt many severe cases of sickness would be prevented. Indeed, I should like to see all arrears of pay, from whatever source arising, which accumulate whilst a soldier is not performing any duty, as well as all compensation for clothing, placed in the Savings' Bank, to be only paid on his final discharge from the service.

Occupation, Amusements, &c.—To improve the health, comfort, and general well-being of the European soldier in India, much has already been effected, and in many respects he is the best cared for soldier in the world. But, nevertheless, there is still much more to be done. Extended and improved barrack accommodation, with increased ventilation, a more appropriate dress, abundant and wholesome rations, are subjects of such paramount necessity, that they have for many years forced themselves on the attention of all connected with the European branch of the service. But there are besides these some scarcely less essential points, which are not undeserving of the most serious consideration of the philanthropist, and of all interested in the European soldier. He has still too much spare

time on his hands, and idleness is the bane of his existence. In-door and out-of-door employment, to lessen that tedium so much felt and complained of in the barrack life of hot climates, should be found for every man. All tradesmen should be enabled to practice their avocations, and those not brought up to any handicraft should, as part of their drill, be trained industrially; not only for present benefit, but to adapt them to re-enter civil society as productive labourers on discharge, and as a safeguard against want in the event of their being discharged without pension; and all should be taught and exercised as sappers and miners, to be afterwards employed in Government works, receiving batta for a certain number of hours' work per week. Suitable employment, however, even under the most favourable circumstances, is not always procurable, and in such a case more attention should be paid to provide innocent and healthy amusement. One fives-court, at which only twelve men can play at a time, is not sufficient for a complete regiment, and others should invariably be erected on each flank of the lines. Where ground and water are available, gardens should be established, and men should be encouraged to cultivate them for profit, as well as for amusement. But as all have not a taste for gardening, a space should be marked off for the erection of sheds and huts, where they could have their workshops, amusements, and refreshments, &c., and likewise where they could keep fowls, rabbits, &c. In such occupations soldiers take a pleasure, and emulation might be stimulated among them by the occasional distribution of prizes, so that much benefit would be gained, even were it only by keeping them out of mischief; and by the bustle, activity, and exercise they lead to, health would be secured.

Invaliding, &c.—In drill, discipline, equipment, and in matters of interior economy, almost all the improvements introduced from time to time into the Royal have been readily adopted by the Honorable Company's European army, and no effort has been spared to place the one on an equality with the other; so that in soldierlike qualities, and in every essential particular of duty, general administration, &c., the soldiers of the two services are now acknowledged to be on a par. The Honorable Company's

European regiments are equipped, disciplined, clothed, rationed, treated in hospital, and accommodated in quarters, exactly as H. M.'s regiments serving in India. On one or two points, nevertheless, there is still a marked difference, and soldiers of the Royal service have to this day certain advantages over those of the Company. For example, invalids of H. M.'s service possess superior privileges to those of the Honorable Company's army. They not only receive increase of pension for good conduct, but those (not entitled to pension) who have suffered from disease can be sent home to the depôt, and on recovery be again brought on the strength of the regiment in India. The Honorable Company's invaliding regulations are far less liberal. There is no increase of pension for good conduct, and when men are deemed unfit from sickness for active service, they are for ever removed from the strength of their regiments; unless it should so happen that they perfectly recover during the voyage home, in which case they may be sent back. But this seldom occurs, and the poor fellows, on arrival in England, are discharged, and lost sight of. There can be no doubt, I think, that many soldiers thus discharged would gladly return to India, if their health became re-established after a year's absence or so. I judge so from the nature of their complaints, as well as from the example of the sister service, and particularly from knowing instances of men discharged from the Honorable Company's army return to India in H. M.'s regiments. Moreover, men thus discharged from this regiment have on recovery re-enlisted into it. For these reasons, it appears to be a question well deserving of consideration, whether, in conferring a boon on men who may have faithfully discharged their duty for years, by retaining them for a certain time on the muster rolls after arrival in England, and sending them back to India on recovery, in fact, in extending to them the advantages of H. M.'s invaliding regulations, the Indian Government would not gain largely; as thus a supply of ready-made soldiers might annually be calculated upon in the room of, and in preference to, untaught, untried, and useless recruits. I have no doubt whatever but that the illiberality of the invaliding regulations greatly augments the mortality in the Honorable Company's

army. I have had applications from men who expected to be invalided, which satisfied me that they would prefer the risk of dying in India to that of returning home with shattered constitutions, to starve in England, or to become a burden upon their relatives. To place the Honorable Company's European soldiers on a perfect equality with those of H. M.'s service, and as an act of common justice, these distinctions should be forthwith abolished. The soldier of the Honorable Company's service ought to have the "*Good Conduct Warrant*" extended to him, both as regards increase of pay for each good conduct ring, and increase of pension on discharge from the service. The invalid not entitled to pension should upon recovery be again brought on the strength of his regiment; and I would even go a step further, and would be glad to see every European soldier entitled to "sick leave" to his native country on the recommendation of the Surgeon of his regiment, sanctioned by the Medical Board.

Furloughs.—But there is still another measure closely connected with the soldier's health and happiness, which seems to me no less deserving the attention of the authorities: I mean leave of absence home on "furlough," as is now granted after certain periods of service to European officers, and to all Native officers and Native soldiers. The European soldier alone is excluded from this boon, but were it extended to men of both services, under certain restrictions, the utter hopelessness with which they now view their prolonged and distant exile would be in a measure half removed; they would soon get reconciled to their condition, and service in India (which is in many respects the best) would soon become the most popular in the world. Such liberality would contribute much to the soldier's good: he would then have an aim, which would act with a stronger force than all the Articles of War in staying him in his thoughtless career; the canteen would be deserted, because he would save his money to spend it among his friends at home; drunkenness would cease, disease diminish, and crime be rare. Every soldier, if in possession of a certain number of good conduct rings, should be allowed a furlough to Europe after ten years' service;

to take his place on the muster rolls of his regiment on his return within two years ; but to be struck off if, without sufficient reason, that period was exceeded. Perhaps no other measure would tend so much to reconcile soldiers to their duties, ensure their good conduct, prevent that longing for home which produces, directly and indirectly, such a numerous class of dyspeptic and other complaints, and exalt the character of the Service. Whilst at home, they might, from their former good character and experience, be very usefully and profitably employed on many occasions in the various military establishments of the Honorable Company, as non-commissioned officers, drill instructors, &c., as well as afterwards on the passage to India with recruits. I may here be allowed to remark that it seems extraordinary that the various staff appointments in the Home establishments are not conferred upon meritorious and distinguished soldiers, of whom many have done the Indian Government good service, instead of selecting individuals often of no actual experience, of little merit, and as a matter of mere favouritism. Many old soldiers, who have long and with distinction served in India, are well qualified for such appointments, and they should be reserved for them.

Transfers.—As regards invaliding and pensioning, we have seen that the soldiers of the Honorable Company's army labour under disadvantages compared with those of the Royal army, but with this exception the services are now completely assimilated. It becomes a question of much moment, under these altered circumstances, if the disparity, which there can be no doubt prevailed upwards of twenty-five years ago, still continues. Lord Ellenborough (without any more recent authority than the ancient documents he quoted) argued as if it still prevails, and he attributed it to the large number of men furnished as non-commissioned officers to Native regiments, and employed in other civil and military duties. The annual decrement in the Bengal European regiments from this cause must doubtless be considerable, as from them, and from the artillery, men must be furnished for many civil duties in the extensive territories of Bengal, the North-West Provinces, and the Pun-

jaub; for many staff appointments in the various military departments of that large army; as well as for non-commissioned officers to the various Native regiments, which I believe are more generally supplied with European non-commissioned officers than those of Bombay. The Town Major's list at Calcutta consequently contains about 500 names. I have no means of knowing, however, to what extent it requires to be recruited annually from the European regiments and from the artillery. That this cause operates to a very small extent in the Bombay army will, I think, be evident when I mention that of the total decrement in the Fusiliers during the last eight years not above 32, or about 4 per cent., arose from transfers to the Town Major's list. As to the supposed inferiority arising from a regiment being denuded of its well-behaved and able non-commissioned officers, the correctness of the inference may be disputed. I should rather be inclined to argue that the high prizes held out to merit would increase the supply, and that for every man so removed double the number would be prepared to succeed him. The alleged inferiority is not apparent, but on the contrary the efficiency of the Honorable Company's European regiments is universally acknowledged, and their glorious achievements in the late eventful times have given them not only an European, but a world-wide reputation. There are, it is true, inconveniences, if not disadvantages, under the present rules, regarding the transfer of men for staff employ, which are attended with great injustice to meritorious individuals. The Serjeant Major, the Quarter Master Serjeant, and the Schoolmaster Serjeant daily witness men of little merit taken from below them for staff appointments with higher emoluments. To be constantly changing men who possess peculiar aptitude for such responsible situations is attended with many inconveniences; and on the other hand to prevent a meritorious, experienced, and efficient Staff Serjeant well versed in his duties, but having depending upon him a young and growing family, from improving his prospects, is doubtless viewed as a hardship. A simple remedy would be to give to the Serjeant Major of European regiments the rank of Sub-Conductor, with the attendant advantages of

pay and pension. After five years' service in that grade he should have the rank, pay, and pension of a full Conductor, and in another five years a Lieutenant's commission. For the other Staff Serjeants, advantages should also be held out to induce them to remain with their regiments.

After these general remarks, I proceed to give a condensed, but more minute history of the Bombay Fusiliers for the last eight years; but as that portion of it, referring to the Punjaub campaign, has already been laid before the Society, I shall touch very cursorily on the events of 1848-49, and on the men rendered non-effective by the casualties of war, &c. They must necessarily, however, be included in the following returns to render them complete. So also the ordinary diseases which prevailed in that period must be included.

Towards the close of the year 1845, when the astounding intelligence flew over India of the Seikh invasion of our provinces on the Sutledge, and when the first Punjaub war keenly and unexpectedly commenced, the Bombay Fusiliers were stationed at Deesa. On the first alarm they were ordered to proceed *viâ* Bombay to Scinde, for service on the Indus. Starting from Deesa about the beginning of November, a march of seventeen days brought them to Cambay, and a voyage in country boats to Bombay. They then proceeded in steamers to Kurrachee, and arrived about Christmas-day. The first night the regiment spent in Scinde was upon the open bunder; most of the men and officers wandered about the whole night to keep themselves warm, being without bedding, tents, or shelter of any kind. They felt the cold severely; and six of the deaths that occurred during the following twelve months were traced to the exposure of that night. For some years afterwards it was spoken of in the regiment as having given rise to its subsequent bad health. There was a halt of some weeks at Kurrachee, for want of carriage, but when it was provided the march up the Indus at the rate of about 12 miles a day, without halts, was commenced, there being no steamers available, and in this way

the regiment reached Sukkur, about the end of February 1846. The termination of the war by the Battle of Sobraon, on the 10th of February 1846, rendered it unnecessary to proceed further, and after a halt at Sukkur of a few weeks, an order arrived to return down the Indus to Tatta in steamers, and to march from that place to Kurrachee.

On the 1st of April 1846 (when the following returns commence) the regiment was encamped in tents at Kurrachee, on the plain, about 1,200 yards in advance and to the eastward of the lines then occupied by H. M.'s 60th Rifles and the Sappers and Miners. The wind was high, and at that time of the year dust blew every day through the tents, rendering them almost uninhabitable. On this account the sick were removed from the hospital tents to the general hospital, the only building then available. They occupied a portion of it until about the middle of May, when the first temporary pendal was completed, and assigned to them. It was very thankfully accepted, because not only were our own sick far from being comfortable, but requiring as they did so much of the general hospital, the parties to whom it more properly belonged were sadly incommoded.

Shortly after the Fusiliers arrived at Kurrachee, H. M.'s 86th regiment also returned from its march up the Indus, and pitched alongside of us in the same line, and at the usual encamping distance. The two regiments thus remained up to the middle of June, when cholera having made its appearance in the most aggravated and fatal form in both regiments, they were ordered to break up from their positions. H. M.'s 86th regiment encamped upon the ridge extending from Clifton towards Ghizree Bunder, and the Fusiliers proceeded to an open airy space, about midway between the Kurrachee camp and that of the 86th to the south, and clear of the lines and cantonments. As there was no building in the neighbourhood that could be converted into a hospital, the sick were not removed from the pendal they occupied, and all fresh cases were brought to it. The arrangement was fortunate, as the regiment had not been long encamped when a violent storm came on, which deluged the whole place, and levelled almost every tent with the ground.

Although every case, when fully developed, was sent to the hospital, yet not always immediately upon being reported sick, but despatched to the hospital tents, as will be hereafter more particularly explained. When the fatal scourge somewhat subsided, the regiment again changed ground to the eastward, to a clear, high, and well-exposed position, above the race-course, where it remained for some months, and until the temporary barracks, then being constructed, were ready for use. By the 1st of January 1847 several pendals were occupied by part of the regiment, but it was nearly the end of the following month before the whole regiment found accommodation in them. From the beginning of November 1845 to February 1847, that is for nearly sixteen months, the regiment (except for a few weeks) could boast of no shelter from heat or cold, dust or rain, better than tents. At last, however, the new pendals were occupied; but so flimsily were they constructed, that in the following April, when Kurrachee was visited by a typhoon, they afforded very indifferent protection. The rain penetrated everywhere, and the buildings were so damaged by it, that lights were kept burning, and sentries mounted guard at night in each pendal, to give warning to those asleep of any appearance of its tumbling down. Fortunately, nothing of the kind occurred, and as the storm abated, the sun-burnt bricks of the walls and pillars, which had so readily absorbed the rain, and thus led to the danger, gradually dried. Afterwards, the pendals being repaired, and rendered again safe and comfortable, the regiment remained in them until it left the station.

During the remainder of its stay at Kurrachee nothing else occurred to affect the health of the regiment, which consequently was never better than in 1847 and 1848. In April of the latter year disturbances commenced in the Punjaub, and on the 19th of that month an officer of the Fusiliers fell a victim to wounds he received after an interview with Moolraj, the noted Chief of Mooltan. In a few months, as is well known, the whole of the Punjaub was in a flame. A force sent against Mooltan met with a resolute and unexpected resistance, and was obliged to retire. Large reinforcements were ordered from

Scinde; and the Bombay Fusiliers, as part of the force destined to coerce the refractory spirit that had been evinced, marched up the Indus. In consequence of the scarcity of carriage, the regiment started by wings, upon the 11th and 17th October, and reached Roree about the beginning of November. Here it was detained for some weeks to allow the rest of the force to collect, to provide carriage, and to complete the necessary arrangements, for what was expected would be an arduous campaign. On the 22nd of December the regiment joined General Whish's camp at Sooruj Khoond, about six miles from Mooltan; and on the 27th the memorable siege of that celebrated fortress was renewed. It lasted twenty-seven days, and, as will be recollected, after a vigorous resistance, (the place being a mass of ruins no longer tenable,) and to save the horrors of an assault, the Dewan Moolraj surrendered at discretion. Some days passed in putting things in order, and the Fusiliers were a good deal occupied in fatigue parties, and in dragging up heavy ordnance for the future defence of Mooltan. On the 2nd of February the regiment recommenced its march to reinforce the Right Honorable the Commander in Chief, held in check by Shere Sing, in the upper part of the Jetch Dooab. Its route lay along the left bank of the Chenaub, which was crossed at Ramnuggur, and on the 19th of February the regiment joined the Bengal army. On the 20th it closed towards the position occupied by Shere Sing's army, and on the 21st the decisive battle of Goojerat was fought. On the 22nd the pursuit of the flying enemy towards the Jhelum, and across the upper part of the Sind Sagur Dooab, was begun, and having witnessed the whole Seikh army surrender and lay down their arms, the Fusiliers again pressed forward in pursuit of the Affghans, now in full flight for their mountain fastnesses, beyond the Khybur Pass. The regiment crossed the Indus at Attock on the 20th of March, and reached Peshawur towards the end of that month. The hot season of 1849 was passed in tents, in the hot valley of Peshawur. Pendals were hastily run up, but from the scarcity of materials, &c. the hot weather was nearly over before they were made use of, and when occupied they were found miserable, low, and confined places, ill provided with doors and windows,

and but in few respects preferable to the tents. At the end of December 1849 the regiment marched from Peshawur, for its own Presidency, and arrived at Poona in April 1850. About sixteen months after, it was warned to proceed to Aden, where active service was expected, but matters becoming settled, the order was countermanded. However, in the cold weather of 1852-53 the Fusiliers were directed to garrison Bombay and Aden; and on the 22nd of January 1853 the head quarters reached the latter station. After being twelve months at each place, the wings relieved each other, (head quarters standing fast,) the right wing proceeded to Bombay, and the left to Aden, where it will probably remain until next cold season, when, according to the order hitherto observed of keeping a regiment only two years at Aden, the whole regiment will probably proceed to some other station.

It appears, then, that between October 1848 and April 1850 the regiment occupied tents for considerably more than twelve months, which, added to the sixteen months previously mentioned, makes nearly two years and a half spent under canvas out of eight. To make amends in some measure for this protracted period of indifferent accommodation, the regiment had the good fortune from April 1850 till January 1853 to occupy the truly splendid barracks at Gorpoorie (Poona), which are in every way worthy of a liberal and enlightened Government. This period of a little more than two years and a half is the only time since I joined the regiment that it has been properly quartered. The pendals so hastily run up at Kurrachee and Peshawur were intended to be only temporary, and were far from comfortable, although beyond comparison superior to the miserable hovels now occupied at Aden.

To enter into any description of the pendals at Kurrachee or Peshawur would be only waste of time, as I believe they have been condemned, abandoned, and demolished at both stations, and barracks in every way suitable for European troops have been substituted. I may, however, give a short description of the barracks at this place. When Aden was taken, in January 1839, by the Bombay Fusiliers and 24th regiment Bombay N. I., aided by detachments of artillery, the object of its capture was

known only to a few, and they were very indifferently acquainted with the arrangements likely to be subsequently made by Government. In this uncertainty, and after the Arabs were expelled, the different parts of the force were located very much according to chance, or to the foresight of those in charge. Certain old buildings were considered well-adapted, and were accordingly appropriated for the reception and protection of commissariat supplies; others for the ordnance and pay department, &c. As a temporary arrangement, and when these stores could not have been secured elsewhere, doubtless the arrangement was proper; but unfortunately it has not been altered, and the anomaly still exists of the best parts of a confined camp being occupied by bakeries, flour-mills, store-rooms, powder magazines, pay offices, gun-sheds, ordnance stores, &c., all crowded together in great confusion, and with little regard to a free circulation of air. The detachment of artillery, to be near their guns, fortunately secured a fine open spot nearly opposite the centre of the bay on which the lines stand; but the European and Native infantry were placed on each flank, under rocky hills, in confined nooks, the one exposed to the reflected heat from high rocks on the north, the other deprived of the breeze on the south, and of that circulation of air the absence of which at Aden is destructive of rest, appetite, and health. The position of the Native infantry proved so unhealthy that it was very wisely relinquished, but to this day the European soldiers occupy the same position and the identical pendals which were hastily run up for their temporary accommodation fifteen years ago. In a triangular space, bounded by the sea on the east, a nullah on the south, and having a high hill as a base, each side not exceeding four hundred paces in length, are situated pendals for upwards of 500 men, as well as the married men's houses, the hospital, the officers' mess-room, and some of their bungalows. The position is low and hot. The barracks are of mats, without verandahs, low, and so narrow that space is not allowed for tables for the men to have their meals at, or for forms for them to sit upon. Fortunately, there has been only two days of heavy rain since the regiment arrived, but on these occasions a stream from the hills rushed through one barrack, pools of water stood in others,

and the next morning, in one of the guard-rooms, the men's cots were floating about in several feet of water. The hospital has verandahs, and is rather wider than the barracks, but with uprights in the centre; tables and forms are mere incumbrances, and for which there is no room. The doors and windows are not intended to keep out wind or dust, but there are punkahs erected, which when used moderate in some degree the oppressive stillness of the atmosphere in the hot weather. To this low hot position, and to the faulty construction of the barracks, I attribute three cases of *coup-de-soleil* which occurred last June and July, and of which I believe there are two or three cases every year, whilst the artillery, who occupy a better position and better barracks, have not lost a man from sun-stroke for five years. New barracks have long been spoken of, and they should be erected on the sea shore, along the bay; and the unseemly masses of old buildings and rubbish which fill up the centre and best part of that position ought to be cleared away. Greater attention should also be paid to ventilation, and then Aden may become a tolerably comfortable and healthy place. But the barracks must be lofty and substantial in structure, and be provided with good doors and windows. With little or no rain, with next to no vegetation, and with an annual range of temperature of less than 30°, a monthly range seldom reaching 20°, and a daily range, for months together, not exceeding 7°, the climate is most equable and healthy, though in the end relaxing, as always must be the case where the thermometer never descends under 74°. There are, besides, at Aden few opportunities of or inducements to drunkenness: the duties are not heavy, and the supplies, although not very abundant, are wholesome, so that the causes of disease at this station, with the exception of the very indifferent barrack accommodation, are few.

The strength of the regiment during the eight years has varied considerably. It has been as low as 671, and as high as 1,096, with an average of 957. During the eventful period which begun in 1838 it was considered expedient to strengthen the European portion of the armies at the three Presidencies, by the addition to each of an European regiment. But although the memorable events which succeeded each other so rapidly

in Affghanistan, in Scinde, at Gwalior, and on the Sutledge, induced the home authorities to increase the strength of the regiments, belonging to the Royal army serving in India, to their full complement, yet that of the Honorable Company's European regiments remained at the old standard, and indeed very seldom attained it. The Bombay Government in 1848, however, resolved to augment the Fusiliers (when about to take the field) by two hundred volunteers from the 2nd European light infantry, and the East India Company have since placed all its European regiments as to numbers on a footing with the Royal regiments.

On the 1st April 1846 the strength of the regiment, exclusive of officers, was 791. At present it is 840, having been lately reduced by the transfer of men to raise the 3rd European regiment. As it is important, however, to make as clear as possible the changes which have taken place in the eight years, I shall place together the total increment and decrement during that time :—

Strength, exclusive of officers, on 1st April 1846	791
Joined in the eight years	845
Total	1,636
Casualties during the eight years	796
Present strength	840
Total.....	1,636

Of the men who have joined since the 1st of April 1846, about 601 were recruits from Europe, 200 were volunteers from the 2nd European regiment light infantry, and the remainder transfers from the Town Major's list, the sappers and miners, the artillery, and the 2nd European regiment light infantry.

The casualties have been—deaths 365, invalids 87, pensioned 115, discharged 59, deserted 15, transferred 155—total 796.

But a better idea of the changes to which an European regiment is liable will be derived from the following table, which shows the annual changes for the eight years, and which accounts for each individual during that period under the several distinct heads.

Return of the 1st *Bombay Fusiliers for Eight Years, commencing on the* 1st *April* 1846, *and ending* 31st *March* 1854.

Station.	Year.	Strength, 1st April.	Joined in the Year.	Total.	Average Annual Strength.	Transferred.	Discharged.	Deserted.	Pensioned.	Invalided.	Died.	Total Casualties.	Annual Reduction per Cent. from all Causes.	Annual Reduction per Cent. from Deaths.
Kurrachee	1846	791	78	869	714	3	1	..	26	12	112	154	21.56	15.68
Kurrachee	1847	715	274	989	869	25	6	..	12	2	18	63	7.24	2.07
Kurrachee, and march to Mooltan.	1848	926	203	1129	940	4	2	..	17	10	53	86	9.14	5.63
Mooltan, Punjaub, and Peshawur..	1849	1043	5	1048	989	3	3	..	30	2	76	114	11.52	7.68
Punjaub, and march to Poona	1850	934	222	1156	1042	9	3	..	5	21	34	72	6.90	3.26
Poona	1851	1084	49	1133	1072	4	10	..	6	7	24	51	4.75	2.23
Poona	1852	1082	10	1092	1060	20	12	1	9	15	13	70	6.60	1.22
Aden	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bombay	1853	1822	4	1026	965	87	22	14	10	18	35	186	19.28	3.62
Aden	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bombay	1854	840	..	..	..	..	..	..	..	..	..	..	..	..
Total			845	..	7656	151	59	15	115	87	365	796	86.99	41.39
Average for eight years					957	19	7	2	14	11	$45\frac{1}{2}$	$99\frac{1}{2}$	10.87	5.17

The loss by deaths, including casualties in the field, and the mortality from cholera in Scinde, has been 365, or about 46 per cent. of the entire loss, and at the rate of 5.17 per cent. per annum. But to be more exact, and to prevent any misconception, I add a few words of explanation.

Died.—Of the 365 deaths, 23 occurred from wounds received in battle; 27 men died violent or sudden deaths,—not in hospital,—that is, 1 was drowned at Kurrachee, 3 in the Indus, 3 at Poona, and 4 at Bombay; 2 died from falling over precipices at Poona, and 1 at Aden; 1 died from the bite of a snake; 1 was murdered, and 1 (the murderer) was hanged; 1 was shot by a lunatic; 5 committed suicide; and 4 expired suddenly, before they could be conveyed to hospital; leaving to be accounted for by the ordinary diseases of the country 315 deaths.

Invalided.—The 87 men under this head were invalided on account of disease, and not having served the prescribed time for pensions, they were sent to Europe and discharged.

Pensioned.—Of the 115 pensioned, 57 were time-expired men, 29 were pensioned on account of wounds received in action, and 29 as invalids, having served the required time for pension.

Discharged.—Of the 59 ranked under this head, 1 was promoted to Ensign for gallantry in action, 18 had a free discharge, 29 purchased it, 3 were discharged by general orders for bad conduct, 4 with ignominy by sentence of court martial, and four were transported. Of the whole number, 29 have occurred within the last two years, and since the late orders facilitating discharge have come into operation.

Deserted.—All the desertions have taken place within the last two years.

Transferred.—Of 155 transferred, 78 were sent to the new 3rd European regiment, 13 to the 2nd European regiment, 1 to the Madras Fusiliers, 28 to the artillery, 3 to the sappers and miners, and 32 to the Town Major's list.

From this table, then, it appears, that the entire loss of the regiment from all causes has been 796 out of an average strength of 957, which is at the rate of about 104 per thousand per annum,

and equal to the entire absorption of the regiment in nine years and seven months. But in instituting a comparison with H. M.'s regiments, it will be necessary to exclude 155 transferred, as the Royal regiments are not liable to this source of decrement. Deducting the transfers, then, from the total loss, there will remain 641 to be accounted for by causes to which both Royal and Honorable Company's regiments are subject. This will give a loss of 83.72 per thousand per annum, from all causes, including the casualties of war, and the ravages of epidemic disease, requiring, therefore (within a fraction) exactly twelve years for the absorption of a regiment one thousand strong. But were these two sources of decrement to be excluded, the loss per thousand per annum would be only 65.17, so that fifteen years and five months would be required for the absorption of a regiment one thousand strong.

Officers.—With respect to officers, the regiment had not its full complement on the 1st of April 1846, because several had just been transferred to complete the newly raised 27th, 28th, and 29th regiments of Native infantry. Strength of officers 1st April 1846, 42; joined since, 25; total 67. Lost from various causes, 19; present strength 48; total 67.

Of the 25 officers joined, 2 who had been transferred to the new Native infantry regiments were, on the European being put on a par with the Native regiments, in regard to the 6th Captain, re-transferred, and 23 were Cadets recently arrived from Europe.

Of the decrement, amounting to 19,—drowned 1, died 6, retired 6, transferred to the 3rd regiment 3, by transfer on promomotion 3; total 19. I subjoin a table illustrative of the above.

Return of the Officers of the 1st *Bombay Fusiliers for Eight Years, commencing* 1st *April* 1846, *and ending* 31st *March* 1854.

Station.	Year.	Strength 1st April.	Joined.	Total.	Average Annual Strength.	Transferred.	Retired.	Died.	Total.	Annual Reduction per Cent. from all Causes.	Annual Reduction per Cent. from Deaths.
Kurrachee	1846	42	9	51	48	1	..	3	4	8.33	6.25
Kurrachee	1847	47	2	49	49	..	..	..	..	..	..
Kurrachee, and march to Mooltan	1848	49	2	51	51	1	1	1	3	5.88	1.96
Mooltan, Peshawur, and Punjaub	1849	48	3	51	48	..	2	1	3	6.25	2.08
Peshawur, and march to Poona	1850	48	4	52	49	..	3	..	3	6.12	..
Poona	1851	49	1	50	48	1	..	1	2	4.16	2.08
Poona	1852	48	1	49	48	..	..	1	1	2.08	2.08
Poona, Aden, and Bombay	1853	48	3	51	47	3	..	..	3	6.25	..
Aden and Bombay	1854	48	..	..	..	..	..	..	..	..	..
	Total		25	..	388	6	6	7	19	39.07	14.45
Yearly average for eight years			$3\frac{1}{8}$	..	$48\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$2\frac{3}{8}$	4.87	1.74

In this return officers *attached* to the regiment are not included, as they constantly fluctuated, and prevented a fair average being taken. Had they been included, the average strength would be about 52, and the proportion of casualties consequently reduced. Only one attached officer died, viz. an Assistant Surgeon, at Sukkur, in 1849, from the effects of opium. Of the 6 officers transferred, 2 were removed upon becoming Lieutenant Colonels; 1 by an after-adjustment of rank, was transferred to a Native infantry regiment; and 3 went to the 3rd European regiment. Of the 6 retired, 4 received pensions from Government, and 2 did not. Of the 7 deaths, 1 occurred from cholera in June 1846, at the head quarters of the regiment; 2 from small-pox, (1 at the Neilgherry Hills in 1846, and the other near Seroor in 1851); 1 from dysentery in 1846, in Europe; 1 at sea, on his way to England; Lieutenant Anderson fell a victim to the treachery of Moolraj, the Dewan of Mooltan, in April 1848, and Lieutenant Colonel Mignon was drowned near Poona on the 4th of June 1852. Eight officers have proceeded to Europe on sick certificate during the eight years: 1 from wounds received at Mooltan; 1 from hepatitis; 1 from cardiac affection; 1 from an abscess near the left axilla; 1 from fever; 1 from asthma; 1 from a paralytic affection; and 1 from dysentery. Of these 3 were on the staff, and 5 were doing regimental duty. No officer has required to proceed to sea, or the Cape, and only 1 to the Neilgherry Hills.

The following table gives the strength and deaths among the women and children for eight years:—

Years.	Women.		Children.			
	Average Strength.	Deaths.	Average Strength.	Deaths.	Women. Ratio of Deaths to Strength.	Children. Ratio of Deaths to Strength.
1846..	55	8	74	9	14.54	12.16
1847..	53	3	71	3	5.06	4.22
1848..	50	2	69	5	4. 0	7.24
1849..	45	2	64	5	4.44	7.81
1850..	36	2	66	4	5.55	6.06
1851..	64	1	68	3	1.56	4.41
1852..	50	3	61	6	6. 0	9.83
1853..	29	1	36	1	3.44	2.77
Total..	382	22	509	36	44.19	54.50
Average of Eight Years....	$45\frac{1}{4}$	$2\frac{3}{4}$	$63\frac{5}{8}$	$4\frac{1}{2}$	5.62	6.74

This table for the last fifteen months is only for the wing of the regiment stationed at Aden. Of these, seven women and three children died of cholera. No officers' wife nor child have died in the eight years.

I shall now proceed to a more minute analysis of the hospital returns. From the table at page 151 it will be easy to estimate the loss of the regiment during the eight years from the ordinary diseases incident to European soldiers serving in India. For this purpose we must exclude the transferred, discharged, and pensioned, as well as sudden and violent deaths, or killed in action, amounting in all to 365, from the total decrement, which leaves 431 casualties to be accounted for by death, invaliding, and pensioning from disease. This will be more distinctly shown by the following table:—

Number of Men of the 1*st Bombay Fusiliers rendered Non-Effective in the Eight Years commencing* 1*st April* 1846, *and ending* 31*st March* 1854.

		1846 to 1854.	Annual Average.
Strength		7,656	957
Died		315	40
Invalided		87	11
Ditto and pensioned		29	$2\frac{5}{8}$
Total		431	54
Non-Effective per cent.	By Death	4.11	0.50
	Invaliding	1.51	0.12
	Total	5.62	0.62

The nature of the diseases for which European soldiers are invalided and pensioned cannot fail to be a subject of considerable interest, and I have therefore arranged them in a tabular form.

Return showing the Diseases on account of which Men were "Invalided and Pensioned" or "Invalided and Discharged," and thus removed from the Effective List.

Diseases.	Invalided and Pensioned.	Invalided and Discharged.	Total.
Fevers	..	2	2
Bowel complaints	1	1	2
Hepatitis	5	3	8
Splenitis	..	1	1
Pulmonary diseases	..	5	5
Cardiac disease	1	3	4
Neuralgia	1	..	1
Cephalalgia	..	2	2
Paralysis	..	8	8
Epilepsy	1	2	3
Mania	2	7	9

Diseases.	Invalided and Pensioned.	Invalided and Discharged.	Total.
Amentia	..	7	7
Ophthalmia	..	4	4
Deafness	..	2	2
Scrofula	..	3	3
Scorbutus	2	..	2
Syphilis	2	11	13
Rheumatism and debility	11	3	14
Disease of the hip joint	..	2	2
Disease of the knee joint	..	7	7
Varicose veins	1	..	1
Other diseases	2	14	16

Of the 16 ranked under "Other diseases," 3 were from fistula in ano; 2 from diseased elbow joints; 3 from ulcers on the legs; 1 from hernia; 1 from fracture of the leg; 1 from amputation of the arm; 1 from contracted hand; 1 from ball through the hand, 1 from contracted wrist; 1 from fracture of the sternum; and 1 from sword-cut of the arm.

As far as can be judged from this table, the number invalided on account of the more frequent diseases of Europeans in India is extraordinarily small, there being only 2 cases of fever, 2 of bowel complaint, 8 of disease of the liver, and 1 of disease of the spleen,—rather under twelve per cent. of the whole number invalided. Affections of the mind form a large item in the return. Of the cases under "Mania," 1 followed an attack of fever, 2 succeeded to meningitis from blows upon the head, 1 became suddenly, and 1 gradually insane, 3 after repeated attacks of cephalalgia, in whom there was a strong predisposition to the disease, and 1 became mad upon religious topics. Under "Amentia" some seemed to become gradually and imperceptibly silly, without any assignable cause, but the greater number were men of weak intellect before joining the regiment, and in some the affection of the mind was most probably congenital. The cases of deafness were of very old standing. A large proportion of the

phthisical cases were affected with incipient consumption upon joining the regiment. The 3 cases of epilepsy were from intemperance. Three of the cases of disease of the knee joint were traced to the long marches to and from Peshawur; others were attributed to sprains, &c. Thirteen were invalided for diseases of the genital organs, or their sequelæ, to which also might be referred several of the rheumatic affections. The remainder were invalided on account of diseases to which men and soldiers are liable in every part of the world.

The first of these tables, although showing the entire number rendered non-effective, is intended chiefly to bring to notice the number who annually become non-effective by *invaliding* and *pensioning*. The per-centage is calculated by throwing together "invalided and pensioned" and "invalided and discharged," and the result is 15 per thousand per annum. During the eight years only 29 have been "invalided and pensioned," whilst 57 returned to Europe as time-expired men with pensions, giving an aggregate of 86 who during eight years have received pensions for their services, which, with an average strength of 957, shows a little more than 11 per thousand per annum. The sepoys of the Native army serve a longer period than European soldiers in India, because they cannot obtain their discharge on account of being "time-expired," as European soldiers can. It would therefore be an unfair comparison between the rates of invaliding and pensioning in the European and Native branches of the army of this Presidency, were the above to be adopted as the correct proportion; but by adding the 87 invalided and discharged to the above 86, and taking the annual per-centage, the exact proportion in which the soldiers of this regiment have been invalided and pensioned during the eight years can be arrived at, and comparison with the invaliding and pensioning of the Native army thus instituted. This proportion with and without pension is as near as possible two and one-sixth per cent. per annum, and if we assume (as per para. 6, page 5 No. VIII. of the Transactions) that 33 per thousand of the Native army are annually invalided, it would appear that the invaliding of sepoys exceeds that of the European soldier by about

one-third. If, moreover, we assume, as shown in the same article, that four-fifths of the Native invalids are discharged with pensions, it would appear that in a given space of time, out of an equal number of soldiers of the European and Native branches of the army, two and a half Native soldiers are pensioned for each European. Since that period, however, the system which then prevailed has been altered, and the invaliding of sepoys is now conducted upon well-defined, intelligible, and just principles, which will in time doubtless work most beneficial changes in the pension establishment.

Before proceeding further, I wish to make a few observations upon the different systems of recruiting, invaliding, &c.

The duty of inspecting recruits for the Royal army, and of determining "whether they are fit or unfit for the military service of the country, is one of the most difficult and responsible an army Surgeon has to perform." The responsibility which attaches to a regimental Surgeon is pre-eminent, for a recruit enlisted at regimental head quarters is subjected to no further examination. Those enlisted elsewhere undergo three medical examinations, and "no recruit is finally approved of until he has been examined and reported eligible by the medical officer in charge of the regiment or the depôt of the corps in which he has enlisted." A degree of responsibility attaches to each medical man who examines the recruit, but the chief share of it devolves on the regimental Surgeon, and the greatest care is consequently taken that no man who is not in every respect fit for military service is enlisted.

Whether recruiting for the Honorable Company's European army is conducted with the same care may be questioned. The nature of the medical examination the recruits undergo before leaving Europe may or may not be minute; but the Surgeon of the corps to which they are posted in India has no power to reject or interfere with any man, although he be "as deaf as a post," or "as blind as a mole." The orders are positive that "no recruit can be discharged as unfit until he has undergone at least two examinations, besides the first inspection on landing," &c.; and accordingly, under Article 19 Section XXX. of

the Regulations, I have had returned unfits completely deaf or paralytic, whose very existence depended on a return to Europe. Under such restrictions, the regimental Surgeon can venture no opinion as to the "constitutional appearance, mould of chest, size of bone, and likelihood of growth of the recruits" who join, nor as to what "promise they afford of becoming active, robust, and well-looking soldiers"; and when it is taken into consideration that the best recruits are drafted for the artillery, it can scarcely be wondered at that men with respect to the "soundness of whose constitution there are doubts," and others, of "deficient stamina, small bone, contracted chests," &c. are found in the ranks of the European regiments. Time is required to detect weakness of intellect, but as the men above alluded to are kept for some months at the depôt before embarking for India, their condition ought to be known to non-commissioned officers and others. How the cases of deafness escape detection, it is even more difficult to imagine; and the men with a tendency to consumption must undergo a very superficial medical examination, or they would never be admitted into the service.

Of the 315 deaths which happened during the eight years, only 241 occurred in the regimental hospital. Several recruits posted to the corps died before joining; some men employed on detached duty, and others sent away for change of air, died whilst absent; whilst a large number died during the severe sickness which prevailed in the detachment kept at Mooltan in 1849. None of these were entered in the register kept at head quarters. Few of the cases or of the *post-mortem* examinations were sent, so that no regular account of the course of their diseases or of the proximate causes of death can be furnished, and being unprovided with the register of sick or of treated, the proportions, &c. cannot be deduced, whilst to add them to these returns would lead to error.

I shall therefore show in a tabular form, first the diseases of which those at head quarters died, and then in a supplementary table include those who died elsewhere. The former is correct in every particular; the latter, perhaps, not quite so accurate. It may appear strange that those sent away for change of air are included in the suplemenatry table, but several died of diseases contracted subsequently, and to include them in the former table would consequently be incorrect.

Table of Mortality in the Regimental Hospital of the 1st *Bombay Fusiliers during the Years* 1846, 1847, 1848, 1849, 1850, 1851, 1852, *and* 1853.

Year commencing 1st April.	Station.	Cholera.	Fevers.	Hepatitis.	Dysentery.	Diarrhœa.	Diseases of the Head.	Diseases of the Chest.	Other Diseases.	Total.
1846..	Kurrachee	83	3	6	6	4	..	4	..	106
1847..	Kurrachee	..	2	4	8	..	..	1	1	16
1848..	Kurrachee, and march to Mooltan.....	..	2	4	7	..	..	1	2	16
1849..	Mooltan, and march to Peshawur	..	7	3	5	4	6	..	1	26
1850..	Peshawur, and march to Poona	7	3	3	6	..	2	4	..	25
1851..	Poona	..	..	2	6	1	1	3	2	14
1852..	Poona	..	1	..	3	1	..	1	2	10
	Aden.....	..	..	..	..	..	..	..	..	
	Bombay	..	..	..	..	..	..	2	..	
1853..	Aden.....	..	1	1	3	..	3	..	..	28
	Bombay	..	1	7	..	..	1	5	6	
	Total....	90	20	30	44	9	13	21	14	241

Supplementary Table showing the Diseases from which those absent from Head Quarters died.

Year commencing 1st April.	Station.	Cholera.	Fevers.	Hepatitis.	Dysentery.	Diarrhœa.	Diseases of the Head.	Diseases of the Chest.	Other Diseases.	Total.
1846..	Bombay	..	..	..	4	..	1	..	1	6
1847..	Bombay	..	..	..	..	..	1	..	1	2
1848..	Ahmednuggur, Carlee, and Bombay.....	1	1	3	3	2	..	2	..	12
1849..	Kurrachee, Mooltan, and Scinde.....	..	23	3	9	..	4	2	2	43
1850..	Bombay	..	1	..	1	..	..	1	2	5
1851..	Bombay	1	..	..	1	..	..	1	1	4
1852..	Bombay	..	..	1	..	..	..	..	..	1
1853..	Passage to Bombay	..	..	..	..	..	1	..	..	1
	Total....	2	25	7	18	2	7	6	7	74

Table showing the Totals of Deaths at Head Quarters and elsewhere.

Diseases.	Deaths at Head Quarters.	Deaths elsewhere.	Total.
Cholera	90	2	92
Fever	20	25	45
Hepatitis	30	7	37
Dysentery	44	18	62
Diarrhœa	9	2	11
Diseases of the Head	13	7	20
Diseases of the Chest	21	6	27
Other Diseases	14	7	21
Total....	241	74	315

All the deaths from cholera, except 2, took place at head quarters, 83 in 1846 at Kurrachee, and 7 in 1850 at Poona. Of those occurring away from the regiment, 1 happened at Bombay, and the other at Carlee. The fatal cases of fever at head quarters are pretty evenly distributed over the eight years, except in the year 1849, when they more than doubled the largest number of any other year. Twenty-five cases of fever proved fatal away from the regiment; of these 23 took place in the detachment at Mooltan in 1849. The deaths from disease of the liver range very equally over the eight years, whilst those from bowel complaints have been from 3 to 10 annually. The detachment at Mooltan in 1849 lost the same number as at head quarters from both these diseases. With respect to these complaints, it is somewhat remarkable that the wing stationed at Bombay should last year have had a heavier loss from hepatic diseases than has yet been sustained by the regiment in any one year, whilst during the last fifteen months it has not lost a single man from bowel complaints.

Under diseases of the head, 5 deaths occurred from *coup-de-soleil* when in tents at Peshawur, and 2 happened here last year. In the same column of the supplementary table, 3 deaths from

delirium tremens are entered,—a disease which has not proved fatal at head quarters since 1846. The rate of mortality during the eight years under review is high, owing to the dreadful visitation of cholera in 1846 at Kurrachee, and to the sickness in the detachment at Mooltan in 1849. Were the deaths in these two periods deducted from the total mortality, the annual per-centage would be comparatively low. Leaving, without further notice, the losses away from the regiment, I shall now give in a tabular form the rates of mortality including all diseases which occurred at head quarters, and then the rates, excluding deaths from cholera. The strength present at head quarters is given instead of the *entire* strength, as heretofore.

Rates of Mortality in the 1*st Bombay Fusiliers for Eight Years, commencing* 1*st April* 1846, *and ending* 31*st March* 1854.

From 1846 to 1854.	Average Strength at Head Quarters.	Total Deaths in Eight Years.	Rate per Cent. to Strength.	Deaths exclusive of Cholera.	Ratio per Cent. of Strength.
Total.....	7406	240	2.25	150	2.03
Annual average of the eight years	923	30	3.25	18.75	2.03

The next table shows the rate of mortality per cent. of strength from different diseases, and ratio of deaths from each disease.

Average Strength.	Diseases.	Number of Cases in Eight Years.	Ratio per Cent. to Strength.	Total Deaths.	Ratio of Deaths from each Disease.
923	Cholera	90	9.75	241	37.50
	Fever	20	2.16		8.33
	Hepatitis.....	30	3.25		12.50
	Bowel Complaints	53	5.74		22.08
	Diseases of Head	13	1.40		5.41
	Diseases of Chest	21	2.27		8.75
	Other Diseases	13	1.40		5.41

It will be seen the greatest mortality in the eight years was from cholera about 37½ per cent.; from bowel complaints (including dysentery and diarrhœa) 22 per cent.; from hepatitis 12½ per cent.; from fever 8 per cent.; from disease of the chest 8¾ per cent.; and from disease of the head upwards of 5 per cent. Under "other diseases" were 2 fatal cases of syphilis, 3 of dropsy, 1 of splenitis, 1 of peritonitis, 2 of variola, 1 of scorbutus, 1 of ulcerated sore throat, 1 of psoas abscess, and 1 of aneurism of the abdominal aorta; in all 13, or upwards of 5 per cent. of the total mortality.

Having given the entire strength, and the average strength of the regiment at head quarters; the entire decrement; the decrement by death, and by invaliding; the deaths at head quarters; the ratio of invaliding to strength; the ratio of deaths to strength; and the ratio of deaths from each disease, I shall now endeavour to show the extent to which the several diseases prevailed in the different years, and at the different stations, with the proportions in which they proved fatal, &c., by condensed returns of each disease for each month of the eight years. A general return of diseases amongst the men, and a similar return of diseases amongst the officers, as well as a table to show at what period of service death is most frequent among soldiers, and another to show the diseases most fatal at the different ages, must, however, be first set out.

From the following return it appears the greatest sickness occurred in 1850, the year the regiment returned to Poona. This may perhaps be accounted for partly by relapses of fevers contracted the previous year at Peshawur and Mooltan, and partly by the prevalence of minor ailments, which always appear when a period of repose succeeds to one of activity and excitement. The next and the following years at Poona, it will be observed, were the most free from disease. The healthiest months of the year, both as regards extent of sickness and mortality, at every Station, were January and February, and next to them October. This table is not complete by the admissions for 1853 of the wing at Bombay. It will be seen that sickness amongst the officers has been pretty equally distributed over the eight years, and has generally been of a mild nature.

General Return of Admissions and Deaths from all Diseases amongst the

Year commencing 1st April.	Stations.	Average Strength at Head Quarters.	April.		May.		June.		July.		August.	
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1846	Kurrachee	709	214	4	139	2	353	83	117	4	138	2
1847	Kurrachee	813	133	..	107	1	125	..	152	4	132	..
1848	Kurrachee, and march to Mooltan and Peshawur	911	128	1	127	3	127	3	100	2	127	3
1849	Peshawur, and march to Poona	810	122	2	110	5	185	5	580	1	375	4
1850	Poona	1062	322	1	377	..	299	2	348	9	297	2
1851	Poona	1071	173	2	158	..	135	..	170	2	142	2
1852	Poona, Aden, and Bombay	1065	143	1	155	..	181	1	206	4	194	1
1853	Aden and Bombay	965	159	..	173	2	180	3	188	1	127	4
	Total....	7406	1394	11	1346	13	1585	97	1861	27	1532	18
	Average of eight years....	923	174	$1\frac{1}{2}$	168	$1\frac{3}{8}$	198	12	232	$2\frac{3}{8}$	191	$2\frac{1}{4}$

Soldiers of the 1st Bombay Fusiliers, from April 1846 to April 1854.

September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Deaths to Treated.
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.				
124	1	96	1	89	4	94	3	72	..	87	1	114	1	1637	106	230·8	6·4
133	1	120	1	80	1	77	1	133	1	129	1	131	5	1452	16	178·5	1·1
97	1	83	..	208	..	171	1	212	..	130	..	132	2	1642	16	180·2	·9
132	1	271	2	214	2	158	2	79	1	57	..	60	1	2343	26	289·2	1·1
232	2	181	2	171	2	169	1	131	1	147	..	182	3	2856	25	268·9	·8
176	4	252	..	171	2	168	2	143	..	103	..	124	..	1915	14	178·8	·7
235	1	223	..	305	..	201	..	173	..	162	1	149	1	2328	10	218·59	0·4
143	3	133	4	133	1	98	5	118	3	116	2	102	..	1670	28	173·05	1·7
1272	14	1359	10	1371	12	1136	15	1061	6	831	5	994	13	15839	241	1714·97	9·41
159	1¾	169	1¼	196	1½	142	1¾	132	¾	104	⅝	124	1⅝	1967	30	214·25	1·12

General Return of Admissions and Deaths from all Diseases amongst the

Year commencing 1st April.	Stations.	Average Strength of Officers.	April.		May.		June.		July.		August.	
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1846	Kurrachee	17	9	..	7	..	8	1	3	..	5	..
1847	Kurrachee	19	3	..	4	..	9	...	2	..	4	..
1848	Kurrachee, and march to Mooltan and Peshawur	28	3	..	2	..	3	...	8	..	10	..
1849	Peshawur, and march to Poona	23	8	..	8	..	7	...	19	..	12	..
1850	Poona.....	24	2	..	7	..	8	...	5	..	4	..
1851	Poona.....	24	4	..	2	..	4	...	6	..	2	..
1852	Poona, Aden, and Bombay.....	22	2	..	5	..	2	...	5	..	3	..
1853	Aden and Bombay	13	..	..	1	..	..	...	1	..	..	..
	Total....	170	31	..	36	..	42	1	47	..	40	..
	Average of eight years....	21	4	..	$4\frac{1}{9}$	..	5	$\frac{1}{8}$	6	..	5	..

Officers of the 1*st Bombay Fusiliers, from April* 1846 *to April* 1854.

September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio of Deaths to Treated.
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.				
7	..	4	..	2	..	4	..	6	..	7	..	3	..	65	1	382·35	1·53
3	..	2	..	5	..	3	..	2	..	4	..	3	..	44	..	231·57	..
8	..	2	..	6	...	4	..	5	..	1	..	5	..	57	..	203·57	..
7	..	6	..	11	..	4	..	4	..	3	..	3	..	92	..	400·	..
4	..	6	..	4	..	5	..	1	..	6	..	9	..	61	..	254·16	..
2	..	5	..	1	..	1	..	4	..	4	..	3	..	38	..	158·33	..
3	..	3	..	2	..	5	..	2	..	1	..	..	..	33	..	150·	..
2	..	1	..	1	..	1	..	1	..	1	..	2	..	11	..	86·15	..
36	..	29	..	32	..	27	..	25	..	27	..	28	..	401	1	1,856·13	1·53
$4\frac{1}{2}$	..	$3\frac{1}{2}$	..	4	...	$3\frac{1}{2}$	..	3	..	$3\frac{1}{2}$	..	$3\frac{1}{2}$	..	50	$\frac{1}{8}$	236·	0·12

The following table shows the period of residence in India of the men who died in the last six years of the ordinary diseases of the country:—

Period of Residence in India.	Strength of each Class.	Admissions of each Class.	Deaths of each Class.	Rate per Cent. of Admission to Strength.	Rate per Cent. of Deaths to Strength.
Under 1 year	413	1025	5	248·18	1.21
From 1 to 3 years ..	1416	3072	32	216·24	2.25
„ 3 to 5 „ ..	1119	2266	25	202·50	2.23
„ 5 to 7 „ ..	1241	2559	13	206·20	1.04
„ 7 to 10 „ ..	1075	1715	16	159·53	1.49
„ 10 to 14 „ ..	896	1784	22	199·10	2.44
„ 14 to 20 „ ..	143	389	4	271·32	2.79
Above 20 years	19	26	1	136·84	5.26
Total....	6,332	12,836	118		

The next table is explanatory of the above, as showing the nature of the diseases of which the different classes died :—

Period of Residence in India.	Fevers.	Hepatitis.	Bowel Complaint.	Disease of Chest.	Apoplexy.	Paralysis.	Dropsy.	Rheumatism.	Variola.	Cholera.	Syphilis.		Ulcerated Sore Throat.	Psoas Abscess.	Total.
Under 1 year.. ..	2	..	2	..	..	..	..	..	..	1	1	..	..	..	5
From 1 to 3 years..	8	2	10	5	4	..	..	..	..	1	1	1	..	..	32
„ 3 to 5 „ ..	2	4	7	5	..	..	1	..	1	4	1	..	..	..	25
„ 5 to 7 „ ..	1	2	5	..	..	2	..	..	1	..	..	..	..	1	13
„ 7 to 10 „ ..	.	4	6	2	2	1	..	..	..	1	..	..	1	..	16
„ 10 to 14 „ ..	1	5	5	4	4	..	1	..	..	..	..	..	1	..	22
„ 14 to 20 „ ..	1	2	..	..	..	..	1	1	..	..	..	..	..	..	4
Above 20 years	...	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Total.....	15	20	35	16	10	3	3	1	2	7	3	1	2	1	118

The limited period over which these tables extend forbids any general conclusions to be drawn from them.

Return of Cholera in the 1st Bombay Fusiliers for Eight Years, commencing 1st April 1846, and ending 31st March 1854.

Year commencing 1st April.	Stations.	Average Strength at Head Quarters.	June.		July.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio of Deaths to Treated.
			Admitted.	Died.	Admitted.	Died.				
1846	Kurrachee	709	212	81	9	2	221	83	31·170	37·556
1847	Kurrachee	813	..	..	..	..	..	..	..	..
1848	Kurrachee, and march to Mooltan and Peshawur	911	..	..	..	..	..	..	..	..
1849	Peshawur, and march to Poona	810	..	..	..	..	..	..	..	..
1850	Poona	1042	..	..	15	7	15	7	1·410	46·66
1851	Poona	1072	..	..	..	..	..	..	..	..
1852	Poona, Aden, and Bombay	..	..	..	..	..	..	..	..	..
1853	Aden and Bombay	..	..	..	..	..	..	..	..	..
	Total		212	81	24	9	236	90	32·58	83·121
	Average of eight years		26·5	1012	3	112	29·50	11·12	..	38·13

In addition to the above, 4 officers, 6 women, and 6 children were attacked with cholera at Kurrachee in 1846, of whom 1 officer, 5 women, and 3 children died, making a total loss in 1846 of 92. One woman was attacked and died in 1850, and one boy in 1851, raising the deaths from this disease to 101 in the eight years.

During the eight years the regiment has suffered on two different occasions from cholera. The visitation of 1846 at Kurrachee was one of the most appalling upon record. It spared neither age, sex, nor class. The number of natives who died could not be ascertained, but it was supposed they perished in great numbers, especially in the native town. So great was the panic amongst them that many fled from the place, and the offer of the most liberal wages failed to induce them to return, or to take employment. The Kurrachee command at that time consisted of about 6,626 fighting men, of whom 3,396 were European soldiers, and 3,232 belonged to the Native branch of the service. Of the former 872 were attacked, and 445 died. Of the latter 476 were attacked, and 234 died. So that 679 fighting men perished. Including, however, women, children, and native followers, the total deaths in different hospitals were 915 out of 1,841 attacked by the disease between the 14th of Jnne, when it made its appearance, and the 11th of July, when it ceased. A few cases occurred before and after these dates, but they were comparatively milder and manageable. On the 14th of June the admissions into the different hospitals were numerous, and they increased rapidly during the night. On the 15th, 175 men were admitted, and 75 died. On the 16th, 277 were admitted, and 186 died, of which number the Fusiliers had 44 admissions and 27 deaths. The disease had fortunately now reached its height, and began to decline. Next day there were only 245 admissions and 116 deaths, and on the following day the admissions were 117, and the deaths 65. The subjoined table shows to what extent the different corps forming the Kurrachee Brigade suffered in that memorable outbreak.

Return of Cholera at Kurrachee from 5th June to 31st July 1846.

Corps and Departments.	Strength on the 1st June 1854.	Europeans.						Natives.				Total.	
		Men.		Women.		Children.		Fighting Men.		Followers.			
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
2nd Troop Horse Brigade	139	8	5	..	..	..	..	4	4	21	16	33	25
1st Co. 1st Batt. Artillery	101	13	1	1	1	1	..	11	5	16	7	42	14
1st Co. 2nd Batt. Artillery	98	24	7	4	..	..	..	12	5	11	5	51	17
3rd Co. 2nd Batt. Artillery	99	27	10	..	..	..	..	7	6	16	8	50	24
4th Co. 2nd Batt. Artillery	92	39	20	1	1	..	..	14	5	26	5	80	31
H. M.'s 60th Rifles	984	120	76	1	1	..	..	..	..	..	..	121	77
H. M.'s 86th Regiment	1091	410	238	18	15	5	4	..	..	1	1	434	258
1st European Regt. (Fusiliers) ..	790	221	83	6	5	6	3	..	..	19	12	252	103
Sappers and Miners	315	2	2	..	..	..	..	16	4	..	..	18	6
3rd Regiment N. I.	1047	..	..	..	..	..	..	67	36	7	4	74	40
12th Regiment N. I...	1043	4	1	..	..	..	..	131	66	35	12	170	79
Belooch Battalion	827	..	..	..	..	..	..	196	93	16	10	212	103
Field General Hospital	..	4	2	..	..	..	..	18	10	282	126	304	138
Total....	6626	872	445	31	23	12	7	476	234	450	206	1841	915

In H. M.'s 60th Rifles, H. M.'s 86th regiment, the Bombay Fusiliers, and the 12th Regiment N. I., the disease seemed to break out simultaneously. On the 15th of June, 135 men were admitted, viz. 51 from H. M.'s 86th regiment, and 28 from each of the others. The cholera decreased in severity in H. M.'s 60th Rifles in four days, in H. M.'s 86th regiment and Bombay Fusiliers in seven days, and in the 12th regiment N. I. in three days. Out of 120 attacked, H. M.'s 60th Rifles lost 76, and the 12th regiment N. I. 66 out of 131. In the 3rd regiment N. I. the disease never raged to the same extent, the greatest number admitted in one day being 9, and the deaths 5. In the Belooch Battalion cholera reached its highest point of severity on the 24th, 25th, and 26th June, at which time it had greatly declined everywhere else. This new regiment lost 93 men. The artillery suffered irregularly: one battalion of 101 men had only 13 admissions, and 1 death; and another of 92 men had 39 admissions, and 20 deaths; but the most extraordinary and unaccountable peculiarity was in regard to H. M.'s 86th regiment and the Bombay Fusiliers. It has been already mentioned that these regiments were encamped in tents, side by side, at the usual encamping distance, for a period of upwards of six weeks. H. M.'s 86th regiment had been under canvas from about the beginning of January; the Bombay Fusiliers from about the beginning of November. The one had during this time marched to Bhawulpore, a distance of nearly 600 miles, and about half the way back again, having had the benefit of steamers from Sukkur to Tatta on returning to Kurrachee; the Bombay Fusiliers had marched from Deesa *viâ* Bombay and Kurrachee to Sukkur, and back again to Kurrachee. From Cambay to Bombay, and from thence to Kurrachee, as well as from Sukkur to Tatta, the Fusiliers went in sailing vessels and steamers; and thus the distance actually marched by the two regiments was nearly equal, although the Fusiliers went over a much greater space of ground, occupying a longer time, and were longer under canvas by about two months. It is generally admitted that marching, fatigue, and exposure predispose to cholera. Both regiments were consequently greatly

predisposed to it, and accordingly both suffered dreadfully. But H. M.'s 86th royal regiment had 410 attacked, and lost 238, out of a strength of 1,091 ; or 37 per cent. were attacked, and 58 per cent. died; whereas the Bombay Fusiliers had 221 attacked, and lost 83, out of a strength of 790 ; or 31 per cent. were attacked, and 38 per cent. died.

How the disease originated it is difficult to say. It may have had a local origin, or have been imported. But it should be borne in mind that the port of Kurrachee closes towards the end of May, in consequence of the south-west monsoon, and the communication between Scinde and the adjacent countries is then very limited. It may also be mentioned that cholera in 1846 prevailed to an almost unprecedented extent over the greater part of India, Persia, and Arabia ; not even exempting Aden, where it has seldom been known, but which suffered severely at the very time when the disease raged with such violence at Kurrachee.

In 1844, cholera having ravaged Central Asia, directed its course towards India, which it reached by a well-defined route. About the end of the hot season of that year the countries north of the Hindoo Khoosh were devastated by the pestilence, and Bokhara, Balkh, and Kooloom lost upwards of 25,000 of their inhabitants ; Samarkhund and Koondooz also suffering to a frightful extent. Travelling south and east, it reached Bamran about the beginning, and Cabool about the middle of October. Before the end of the month it carried off 6,000 people in that city, and raised such a panic among the inhabitants that they fled from the place. The dead could scarcely be buried, and the prisoners were all released by order of the Ameer. By the 8th of November the disease had nearly disappeared at Cabool, but had extended to Jelalabad; and towards the end of November it made its appearance at Peshawur. It seemed to linger about Peshawur during the cold season, but in March and April again made frightful progress, extending to Hoosain Abdool and Jhelum, destroying 500 men of General Court's regiment at the former place. In May it broke out at Lahore, where it was supposed to have carried off 22,000 people. In June, having showed

itself at Umritsur and Kurpoor, it crossed the Sutledge, and broke out at Ferozepoor, and afterwards at Loodiana. Continuing its course towards Central India, it here sent off a ramification down the Sutledge and Indus, to Sukkur, which place it reached on the 15th of June. It began to subside at Sukkur about the 26th of June, and by the beginning of July had altogether ceased. It, however, continued its course down the river, and broke out at Hydrabad about the middle of July, and afterwards proceeded onwards to Tatta and Kurrachee, but by the time it reached the latter place it had abated much of its violence.

Although there was no violent outbreak of cholera during the following months, yet Kurrachee was not entirely free from it. Isolated cases in the camp, town, and vicinity continued to occur throughout the following cold and hot seasons. It seems not improbable that the terrible disease of June 1846 may have arrived in Kurrachee in the previous year. That it did not previously show itself in an aggravated form may, perhaps, be explained by the absence of certain adventitious circumstances necessary to its full development. What was wanting may have been supplied about the beginning of June, when the weather begins to partake of the peculiarities of the south-west monsoon, which sets in along the coast of Malabar, the Concan, and Guzerat about the end of May, or the commencement of June. Although the annual fall of rain at Kurrachee, and throughout Scinde, does not probably average four inches, yet the winds then blow steadily from the south, and south-west, and are loaded with moisture. Clouds accompany the winds, and sweep over the southern coast of Scinde, whilst, most likely, those electrical changes which usher in the monsoon elsewhere, are also more or less felt. Previous to the appearance of the clouds, the sun is powerful, and when the winds lull, the weather is hot and sultry. Such a state of the atmosphere, when epidemic influence prevails, is favourable to the appearance and propagation of disease, and may have called into active operation the peculiar choleraic influence then prevailing, not only in and around Kurrachee, but over a great part of the Asiatic continent.

That any such change in the weather could of itself produce the specific cholera virus, I do not suppose; and indeed were it so, Kurrachee ought to be visited annually by cholera, as the weather in June 1846 varied very little from what it always is at the same season of the year, as the following meteorological register will show :—

Meteorological Register for the Month of June 1846, 1847, *and* 1848, *at Kurrachee.*

Year.	Thermometer.			Pluvio-meter.		Meteorological Observations.
	Minimum.	Maximum.	Mean.	Inches.	Cents.	
1846..	80°	92°	86°	..	..	Winds during the early part of the month from south-west, with occasional dust-storms. Latterly from south-east, with a thunder-storm and rain on the 21st, but of which no register was kept, the Regiment being out of Kurrachee in tents. Mornings and evenings cool, mid-day hot and sultry. In tents the thermometer rose to 98°.
1847..	82°	95°	88°	3	..	The weather in the early part of the month was hot and oppressive. After a fall of rain on the 24th and 28th it became more cool and pleasant. No dust-storm occurred during the month.
1848..	82°	95°	88°	..	..	South-west winds have prevailed during the month, with boisterous, dusty, and oppressive weather at times. No rain.

A remarkable atmospherical phenomenon not mentioned in the above observations I find recorded in my report for 1846 :

"The weather on the 14th of June was in every respect similar to what it had been for several days, till between 5 and 6 P. M. About that time, and during Divine Service, a singular state of the atmosphere was observed. The wind veered round from west and south-west to north-east, and although there was scarcely any breeze, it was raw, chilly, and unpleasant to the feelings, and a thick lurid cloud, apparently of dust, hung low, and almost stagnant, over camp." Some people observed, or fancied they observed, at the same time, an offensive, suffocating, and putrid odour, and that a sudden nausea was produced; but these I did not remark. The atmosphere had for about half an hour the appearance that often precedes a storm, but it gradually cleared away, and by 7 o'clock it was clear, and again fine.

That there was some connection between this atmospherical phenomenon and the appearance of cholera, there is strong reason to believe, from the extraordinary intensity with which the disease raged and spread so immediately afterwards, from the unpleasant feelings and nausea experienced at the time, and because similar storms have been often observed to precede the appearance of epidemics. That it was the actual exciting cause of the disease is not likely, but that it was an indication or result of that unascertained and inexplicable intemperament of the air which originates or at least favours the propagation of cholera seems very probable. The specific cause, whatsover that may be, most probably previously existed. It may have been accumulating in the systems of the future sufferers, and predisposing them to the attack. It may have been called into active operation at the time the cloud hung over the camp. It is certainly *possible* that the epidemic choleraic virus had no previous existence, but was generated and diffused by the peculiar state of the atmosphere on the evening of the 14th of June, but from the fact of the disease prevailing in and around Kurrachee for some time previously, I am inclined to believe that the origin of its sudden fatal and fearful intensity, so immediately manifested, was due to that agency of which the meteorological disturbance was a sign or effect.

There are many sources of disease about the camp and town of Kurrachee which may render cholera *endemic*, or at least induce it to attach itself to the neighbourhood, and when it has so attached itself may, moreover, so predispose the human system to its influence as to give it that concentrated and intense form which it assumed in June 1846. The town of Kurrachee, distant about a mile and a half from the camp, lies low. It is indeed merely a poor fishing village, situated on the skirts of extensive mangrove swamps and muddy creeks. Like all Native towns, it is close, dirty, and confined; but the inhabitants are by no means a sickly race of people. The camp occupies a somewhat more elevated position. It is to the eastward of the town, and is exposed to the west or south winds for eight or nine months in the year, which blow over a piece of filthy common lying between the camp and the town. The camp is open, without enclosures, and with few hedges; but at the period referred to it was not in a very clean condition. These sources of disease were common to all, but there were others peculiar to the position of the camps of H. M.'s 86th regiment and the Bombay Fusiliers. They lay still further to the eastward, to leeward of the other lines, and to the Sudder Bazar. Between the latter and these camps, although not in a direct line, were the general hospital, the burial ground, the bheestie warra, the butchers' shambles, as well as another large piece of bare waste ground, where all dead animals, the cleanings of necessaries, the sweepings of streets, and where in fact most of the filth and offal of the camp were deposited. The accumulation of putrid animal and vegetable matter was enormous. When the disease broke out the Fusiliers had been too long encamped upon the same spot; insomuch that the smell of urine was at times intolerable. The tents were crowded, and ventilation was too little attended to. This was afterwards rectified by throwing down the walls of the tents for a certain number of hours, twice a week. Under these circumstances there was certainly enough, if not to engender disease, at least to encourage its propagation and extension; and I have always viewed them as accounting for the intensity of the attack in these two regiments. Moreover, as before mentioned, both regiments had

returned from long marches, had long been under canvas, and had lost the excitement of change, and of new scenes. Probably, also, the steadier habits of the men on a march had become relaxed, so that they were greatly predisposed to any disease that might become prevalent. Admitting, however, that with respect to these two regiments, this explanation, as far as it goes, is satisfactory, how are we to account for the great difference in mortality between them?—H. M.'s 86th regiment losing two and a half times more men than the Fusiliers. The former corps, from its position to the right, was certainly more exposed to the filth lying to the eastward of the Sudder Bazaar, and unless that be taken as the reason of the difference, I know of no other. How, again, is it to be explained that H. M.'s 60th Rifles, which had no marching, but were all along in tolerably comfortable barracks, although having fewer men attacked, lost nearly as many as the Bombay Fusiliers? The 12th Regiment N. I. and Belooch Battalion lay to the north of the lines occupied by H. M.'s 60th Rifles, and a considerable open space intervened between that corps and the lines of the horse artillery, the 3rd regiment N. I. cantonment bazaar, and sappers and miners; and the greater severity of the disease among the troops on the north than on the south of that space was very remarkable. These are anomalies on a large scale; but other smaller ones are equally inexplicable. In one company of the Fusiliers only 12 cases of the disease occurred; in the company next to it there were 29. No. 3 company lost 14 men; No. 4 only 3, whilst No. 5 lost 13. Again, almost every servant of some of the officers died, whilst others lost none at all.

On the 3rd of June a slight case of cholera occurred in hospital, and 2 others on the 6th, but they recovered. On the 7th a mess cook was seized, and died. On the morning of the 14th 5 men were admitted into hospital with looseness of the bowels, but without any other symptom of cholera, and they all did well. At the evening visit a case of cholera was reported. The man had not been in any way exposed; he had not left the lines, but spent the day reading in his tent. About 4 P. M. he felt unwell, and symptoms of cholera soon revealed themselves. He was

admitted about half an hour before the visit, and was then labouring under the disease in its worst form. At 9 P. M. he was worse, the disease evidently continuing its course uninfluenced by the measures adopted; at half-past 1 A. M. of the 15th he was in a hopeless state, and died at 4 o'clock. During this time the number of admissions increased rapidly, and by 11 o'clock there were 19 cases under treatment, and 3 deaths. From the evening of Sunday the 14th to the morning of Tuesday the 16th there were 30 cases admitted, of whom 24 died, viz. 11 on the 15th, 12 on the 16th, and 1 on the 18th. In three days and a half from the first admission 119 were attacked with cholera, of whom 57 died. In the next twenty-three days 102 were attacked, and 27 died. The mortality amongst those seized within the first thirty-six hours was enormous, viz. four-fifths of the whole number. But it lessened insomuch that whilst during the first three and a half days only one-half escaped, during the remaining days a fraction less than 3 in every 4 escaped. From the 14th of June to the 1st of July 216 men and officers were attacked, of whom 81 men and 1 officer died. From the 1st to the 11th of July, when the last case occurred, 9 men were attacked, and 2 died. During the whole of this fearful visitation, 225 cases of cholera happened, and 84 died, *i. e.* about 1 death to every $2\frac{2}{3}$ attacked.

More men, however, were seized with the disease than the returns show, because on the 16th of June it became advisable to remove the regiment from the locality it had so long occupied, and where the pestilence was raging so uncontrolably, to a situation inconveniently distant from the hospital. It became necessary, therefore, to provide at emporary or receiving hospital. In it a number of men with premonitory or mild symptoms of cholera were accommodated, and many thus returned to their duty after being detained a short time, and receiving prompt medical assistance, without being sent to the large hospital, and consequently without being brought upon the returns. If the disease did not yield after the first dose of medicine, the case was transferred to the other hospital. The arrangement proved most useful. In this way, by the early administration of proper remedies,

I have no doubt whatever that the disease in numerous instances was arrested, and the patients saved from a very serious attack. The men did not hesitate to avail themselves of the temporary hospital the moment they felt unwell, knowing they would be detained only a few hours, and should the attack prove slight, return to their quarters. They maintained their confidence whilst they remained, and many poor fellows from a reluctance to entertain the idea that they were really under the influence of the merciless disease, or from a hope that they might still shake it off, evinced the utmost alarm and unwillingness to proceed to the other hospital, which had now become a melancholy scene of suffering, and of death. Had the names of all the men treated in this temporary hospital been registered, it would have made a considerable difference in the "treated" and "ratio of deaths." The disease, on its first appearance, assumed a malignity of type I never before witnessed. The symptoms varied in different cases, both in degree of severity as well as in priority of appearance. Probably the following was the most general course. At first a trifling looseness was observed, with, or without a little previous indisposition; such as lassitude, languor, nausea, or faintness. In 2 instances the feeling of faintness amounted to actual syncope. This first gave notice of the attack, which the unfortunate individual had till then attempted to conceal, or to struggle against. Sometimes these symptoms appeared simultaneously with the purging, but in all instances the faintness and exhaustion so rapidly increased as scarcely to be accounted for by the degree of purging at this early period. Vomiting succeeded the second or third stool, or in some instances it appeared along with the purging. In a few cases vomiting was the first symptom. It was attributed to drinking water, or to something that had disagreed with the stomach, and relief was sought in a dram at the canteen. As the vomiting and purging increased in frequency, the evacuations became watery, and colourless, or like conjee water, with the characteristic odour. To these succeeded increased anxiety, restlesness, and jactitation, with a burning internal pain, and an unquenchable thirst. Cramps began in the feet, and soon extended to the legs, thighs, and abdominal

muscles. In other cases the invasion of the disease was more sudden: the purging, vomiting, and cramps made their appearance together, but generally the cramps did not begin till after the first or second effort at vomiting. In many cases there was excessive restlessness, tossing about in bed, and intolerance of bed-clothes; and the burning sensation about the epigastrium was most distressing. Every part and function of the system was in a disturbed state, but there was no excitement of the circulating system, nor any distinguishable attempt at reaction; on the contrary, the pulse gradually became more feeble, small, and oppressed; the skin, especially of the extremities, became cold, and covered with a profuse cold and clammy sweat. The fingers and hands were sodden and shrivelled; the nails blue, and bent inwards. A blueness of the skin was observed at first about the cheeks and neck, and afterwards in other parts. The vomiting and purging at length became less frequent, but without affording any relief, as the burning and oppression at the præcordia continued rather to increase. The cramps became less severe and frequent, but at the same time the coldness of the extremities increased; the pulse became smaller, or altogether imperceptible; the eyes—often bloodshot—were sunken and turned up in the sockets, with the usual livid circle round them; the blueness of the surface of the body, and the cadaverous appearance of the countenance, increased, with confusion of ideas and drowsiness, from which the patient could be roused with difficulty. The powers of reaction seemed soon afterwards completely destroyed. There was no return of cramps, purging, or vomiting. The vital functions were involved in a general torpor; the circulation of the blood became more and more languid, and at length it seemed to cease; respiration became short and oppressed; and nervous exhaustion and utter collapse terminated the hopeless struggle.

The secretion of urine was in every case interrupted. Its return was hailed as a good omen, as was also a little natural sleep. In no instance, during the first days, was, what may be considered the febrile stage of the disease, with increased force of the circulation, warmth of surface, or general excitement, observed;

on the contrary, there was an early tendency to torpor, coldness, and collapse in all cases.

During the first three days the most powerful medicines seemed to have lost their effect: the worst cases terminating fatally in from seven to nine hours. In several instances the disease ran a more rapid course, death ensuing in four and a half hours. In some, where the attack seemed mild, with little vomiting, purging, or cramps, and apparently with little derangement of the system, collapse suddenly supervened, followed by a speedy fatal termination. In the less aggravated cases, and at a later period, when the epidemic seemed to have expended its violence, remedial means were more efficacious, and the patient enjoyed a fair chance of recovery.

At first, each case was treated according to its symptoms, and the prescriptions varied accordingly. But when the numbers of admissions rapidly increased, it soon became apparent that if this plan were invariably pursued, it would be impossible for the hospital establishment to compound the various medicines prescribed, and at the same time to attend to their other fast-multiplying duties. The following formulæ were therefore prepared in large quantities, No. 1 for immediate administration, No. 2 for subsequent use, as well as a scruple of calomel in powder, or a scruple of calomel and 2 grains of opium in 2 pills:—

No. 1 *draught.*—R. Tinct. Opii ℥ss.
„ Assafœtidæ.
„ Valerianæ āā ℥i.
Misturæ Camphoræ ℥i.
Magnesiæ Carbonatis ℈i.
Make a draught.

No. 2 *draught.*—R. Ether Sulphuric ℥ss.
Spirit: Ammon: Aromat: ℥i.
Ol: Menth: Pip: m. iv.
Sodæ Carbonas gr. x.
Spirit. Vini Gallici ℥i.
Make a draught.

General Directions.—The calomel powder or the calomel and opium pills, with or without No. 1 draught, to be given imme-

diately on admission, and if rejected, or otherwise required, to be repeated. No. 2 draught to be given as required in the after stages. A mustard poultice to be applied to the epigastrium, and if necessary a blister afterwards; the extremities to be well rubbed, and hot bottles applied to the feet and hands.

As indicated by the prescriptions, an attempt was in the first instance made to check the vomiting, purging, and cramps. For this purpose calomel and anti-spasmodics were liberally given, and the dose was repeated as often as rejected. When it was retained, and no abatement of the symptoms followed, it was repeated at latest in two hours; and sometimes the quantities given in this way were very considerable. On the morning of the 16th an officer with the incipient symptoms of cholera took ten grains of opium and sixty grains of calomel, before twelve o'clock. He was ill for some days afterwards, but ultimately did well. As soon as the drain on the system moderated, and the slightest symptom of collapse became apparent, the treatment was strictly stimulating. In addition to the above, brandy and water, hot or cold, as desired, was given frequently, and at times undiluted brandy. Tea or ginger tea formed the common beverage, but cold water if preferred was not denied. Effervescing draughts and soda water, to the latter of which was frequenty added 10 grains of carbonate of ammonia, were also liberally given. Whilst collapse lasted, hot applications, constant friction to the extremities, and sinapisms to the epigastrium were continued. In only four instances was bleeding had recourse to. On the 15th two men were bled, but with results so unsatisfactory, that the practice was not persisted in. In both cases the cramps were relieved, but unfortunately the pulse fell, and never revived. Instead of relieving the oppressed and labouring circulation, by withdrawing the dark and tenacious blood, that seemed to load and embarrass the heart's action, the only effect of the bleeding was to depress still lower the powers of the system, to render the pulse less distinct, or altogether imperceptible, and accelerate the final catastrophe. Unfortunately, in the early stages of the disease, during the first days after its appearance, there was no excite-

ment, no febrile or inflammatory action to subdue. I saw no case in that stage where I could attribute death to congestion, or to lesion of structure of the liver, or of any other internal organs. Death seemed to proceed rather from a rapid and uncontrolable exhaustion of vital power. With a sinking pulse, &c., bleeding must evidently prove a most hazardous practice. Twenty days afterwards, when the disease was on the decline, it was again tried, and apparently with benefit, but the disease had become more tractable, and most of the cases terminated favourably. In the Kurrachee form of cholera I believe bleeding should be practised with great care and circumspection. In severe cases it is of no avail, and mild ones do equally well without it. It is true the blood has become changed, unwholesome, and unfit for the purposes of life; but until the causes can be discovered and removed on which this condition of the blood depends, it will not be found easy to restore it to its pristine healthy state; and the removal of a part of the already very reduced quantity cannot necessarily improve the condition of the remainder. When reaction takes place, from the balance of the circulation being so deranged, congestion and its consequences must be guarded against, and local and general bloodletting cannot be dispensed with. The universal and fearful derangement of every function of the body, the violence sustained by various organs and structures, and the shock to the nervous system occasioned by the long-continued retching, purging, spasms, and probably in some instances by medicines, often resulted, as might be expected, in fever, gastro-enteritis, and subacute cerebral or spinal inflammations. To subdue these conditions, in constitutions already so impaired and debilitated, requires much care and attention. In some instances, it is true, as soon as the more urgent symptoms subside, the patients recover rapidly, and without any bad after effects. Merely occasional aperients, leeches to remove local congestion, and tonics for a few days, are required, assisted by nourishing diet, small quantities of wine, beer, &c. In other instances, the morbid changse are less easily overcome, and the convalescence proceeds less favourably. The irritability of the *prima viæ* remains, and the

patient is brought to the verge of the grave by an exhausting diarrhœa. In others there are drowsiness, incoherence, or insensibility. The eyes are suffused, and turned upwards; the skin dry and hot; the pulse quick and thready; and the tongue dry and red, or loaded. The most formidable symptoms often appear to depend upon congestion of or effusion upon the brain or spinal chord. In such cases as these calomel was given with occasional purgatives; leeches applied to the temples, or behind the ears, and blisters to the back of the head. If tenderness of any part of the abdomen was observed, leeches or blisters were applied, as seemed best. In other instances, where the constitutional disturbance had been still greater, the symptoms assumed even more of the typhoid character, and required to be treated accordingly. In numerous instances, the sequelæ seemed to place the patient in as imminent danger as the original disease; but only 3 men died from these after causes.

At Poona, in July 1850, cholera, which had been for some time prevalent in the districts, the city, and sudder bazaar, made its appearance in the Fusilier lines, and carried off 7 out of 13 men attacked. 3 out of these 7 fatal cases were suffering from other diseases when they were seized with cholera. The greatest number of admissions came from one particular company, and from one barrack. It was singular that none of the camp followers, nor any natives belonging to the lines, were attacked. I could not discover anything peculiar about the barrack room; but a nullah in front of the hospital was at the time used as a necessary by the Sappers and Miners, and was in a very filthy state. So also was a gravel pit nearer the hospital employed for a similar purpose. Both nuisances I got removed. To describe the symptoms of the disease which appeared in 1850, or its treatment, would be useless, and a mere repetition of what has been already said.

Fevers, although far from being next in importance to cholera, stand next on the return.

Return of Cases of Fever in the 1*st Bombay Fusiliers, for Eight Years, commencing the* 1*st April* 1846, *and ending* 1*st April* 1854.

Year commencing 1st April.	Stations.	Average Strength of the Regiment.	April.		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio of Deaths to Treated.	Ratio of Deaths to Strength.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.					
1846	Kurrachee	709	39	1	36	..	37	1	28	..	23	..	18	..	16	..	22	..	14	..	11	..	19	1	18	..	281	3	39·63	1·06	0·42
1847	Kurrachee	818	18	..	8	..	18	..	38	..	19	..	39	..	51	..	20	..	16	..	19	..	24	..	33	2	303	2	37·26	0·66	0·24
1848	Kurrachee, and march to Mooltan and Peshawur	911	18	..	19	..	14	..	17	..	30	1	14	..	19	..	69	..	40	1	29	..	28	..	60	..	357	2	39·18	0·56	0·21
1849	Peshawur, and march to Poona	810	37	1	33	1	86	..	524	..	366	..	72	1	207	2	148	1	57	..	26	..	16	..	11	1	1593	7	196·66	0·43	0·86
1850	Poona	1062	142	..	178	..	145	..	205	..	156	1	105	..	76	1	69	1	50	..	36	..	28	..	33	..	1226	3	115.44	0·24	0·28
1851	Poona	1071	48	..	33	..	28	..	24	..	22	..	47	..	73	..	80	..	54	..	28	..	13	..	23	..	473	..	44·16	..	..
1852	Poona, Aden, and Bombay	1065	34	..	28	..	39	..	54	..	66	..	86	..	79	..	149	..	74	..	42	..	15	..	27	..	703	..	66·01	..	..
1853	Aden and Bombay	965	21	..	51	..	69	..	69	1	25	..	28	..	29	1	25	..	17	..	13	..	18	..	11	..	376	2	38·96	0·50	0·20
	Total		357	2	386	1	449	1	959	1	707	2	409	1	550	4	582	2	342	1	204	..	161	1	216	3	5312	19	577·32	3·45	2·21
	Average of eight years		44·62	0·25	48·25	0·12	56·12	0·12	119·87	0·12	88·62	0·25	51·12	0·12	68·73	0·50	72·76	0·25	42·75	0·12	25·50	..	20·12	0·12	27·	0·37	664	2·37	72·12	0·37	0·25

The above return includes all except eruptive fevers, which occur so seldom among European soldiers in India as to demand very little consideration. The fluctuation in the number of fever cases in the different years is considerable, as also in the different months in the year.

Scarcely 40 per cent. of the total strength, or less than 1 in 2, were affected with fever at Kurrachee in 1846, but in 1849 at Peshawur 200 per cent. of the strength were attacked, or in other words, every man had two attacks of fever. The difference is to be accounted for by the epidemic fever which visited Peshawur in July and August of the latter year. The rates of mortality are, however, in an inverse ratio to the number attacked, as at Kurrachee in 1846 more than 10 per thousand of those attacked died, whereas at Peshawur in 1849 less than 5 per thousand fell victims to the disease. Again in 1850, at Poona, the fever cases were very numerous, but the deaths were only 3, or less than $2\frac{1}{2}$ per thousand of admissions. The large number treated in this year may be accounted for by relapses of those attacked in the previous year at Peshawur, especially of those who suffered at Mooltan. The circumstance of nearly three-fourths of the whole number having occurred in the first six months, and only one-fourth in the second six months of the year, tends to corroborate this view. In 1851 the admissions were barely 40 per cent. of those of the previous year, and there was no death. In 1852 the admissions again increased, and no death is shown in the return, but a patient admitted with syphilis got irritative fever, and died suddenly, his death being returned under that disease. In 1853 the admissions are again reduced, and 2 deaths ocurred—one at Aden, and one at Bombay, although the former might more properly have been ranked under *coup de soleil.* During the eight years the deaths from fever have been $2\frac{1}{2}$ annually, rather more than $3\frac{1}{2}$ per thousand of men treated, and less than 3 per thousand of strength. The months of January, February, and March have at every station been the most exempt from fever.

In a report I formerly made on the health of a Native regiment stationed at Baroda, I stated that I "had not found the fever of

Guzerat to be that formidable and intractable disease that it was generally considered to be, as out of 5,178 cases that had occurred in five years, only 33, or $6\frac{1}{4}$ per thousand, had proved fatal." From the preceding return it would appear the statement need not have been confined to Guzerat, but might be made applicable to, and extend over, the greater part of India, and to European as well as to Native soldiers. Nevertheless, as fevers in a series of years constitute upwards of one-third of the total sickness, they form an important item in the returns. They also, not unfrequently, are anxious cases. If at the commencement they are neglected, or a certain train of symptoms are not at once subdued, or if the type changes from the intermittent to the remittent or continued, or if of the latter they obstinately resist showing a remission or intermission, then not only are they very troublesome cases, but the patient is often placed very rapidly in imminent danger. Fortunately, however, these types are rare, and in the majority of cases, either simple uncomplicated quotidian, or irregular tertian intermittent fever is seen, the paroxysm coming on about 11 A. M., and terminating about 3 or 4 P. M. The first attack is generally the most severe. It seems to confer an exemption from future severe paroxysms, but at the same time it creates a greater predisposition to a return of the disease, insomuch that many men never fail to have a relapse after a slight excess, irregularity, exposure, or inattention to the bowels, and at each phase of the moon ; so that in a year, perhaps, the same person is admitted ten or twelve times for this disease. Relapses from fever make up a large proportion of the admissions, but they are always easily subdued, and do not seem to injure the constitution in any serious degree.

In a paroxysm, especially of a first attack, there is pain of the head, back, and loins, heat of skin, full, bounding pulse, dry tongue, flushed countenance, anorexia, costiveness, and scanty high-coloured urine ; very often considerable irritability of stomach, thirst, nausea, retching, and vomiting of bilious matter.

Functional derangement of the stomach and biliary system is generally present, and the head-ache seems to depend upon it. I begin the treatment with an emetic, which generally brings away

a greater or less quantity of bile, and the skin becomes relaxed, the tongue moist, and the head-ache is relieved. When the stomach is again settled, a cathartic dose is given, but if the patient is admitted in the evening, after an emetic, ten grains of calomel are prescribed, and the cathartic the following morning. If pain or heaviness of the head continues, leeches are applied to the temples, and if next day there is complete apyrexia, quinine is commenced the moment the bowels are freely moved. If there is no apyrexia, a solution of tartar emetic is ordered, and if necessary general bleeding or a repetition of the leeches to the head or elsewhere. The cathartic dose is generally repeated once or oftener, according to the length of time the patient remains in hospital, which upon an average is about five days. Quinine proves infallible in arresting the disease for the time, though not in every instance able to prevent its return after a certain interval. When the paroxysm has ceased to return, convalescence is assisted by light aromatic bitters, with a gentle aperient now and then.

Such are the characters, &c. of the fever ordinarily met with, but cases occasionally occur with more marked and prominent features. In them the remission is less perfect, the head-ache more intense, and less easily subdued. There is excitement, restlessness, and want of sleep; the tongue continues dry, red, or loaded with sordes; there is no appetite, but much thirst; the skin is hot and dry; the eyes are bloodshot; and the pulse is full, hard, and frequent. In these cases, emetics seldom fail to produce benefit, by removing all irritating matters from the stomach, relaxing the skin, and restoring the balance of the circulation; afterwards the antimonial solution to keep up nausea is very useful, and attention to the state of the bowels is required. Frequently general blood-letting can be well borne, and cold affusion to the head affords great relief. When local affections complicate the case, they have to be treated according to their seat and nature. As soon as an opportunity offers, quinine should be freely given.

Return of Diseases of the Liver in the 1*st Bombay Fusiliers for Eight Years, commencing* 1*st April* 1846, *and ending* 1*st April* 1854.

Year commencing 1st April.	Stations.	Average Strength of Officers.	April.		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio of Deaths to Treated.	Ratio of Deaths to Strength.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.					
1846	Kurrachee	709	3	1	2	1	6		4	..	1	..	..	..	2	..	3	1	..	2	1	..	4	..	4	1	30	6	4·23	20·00	84
1847	Kurrachee	813	6	..	3	..	10	...	2	2	9	..	3	..	5	..	4	..	1	..	5	1	1	1	7	..	56	4	6.88	7·14	49
1848	Kurrachee, and march to Mooltan and Peshawur	911	3	..	4	..	5	2	6	..	6	..	4	1	3	..	2	...	2	..	12	..	5	..	2	1	55	4	6·03	7·27	43
1849	Peshawur, and march to Poona	810	5	..	6	1	8	1	4	..	5	..	4	..	2	..	1	..	6	..	3	..	3	..	4	..	51	3	6·29	5·88	37
1850	Poona	1062	9	1	15	..	10	1	5	1	6	..	6	..	3	..	4	..	5	..	4	..	3	..	3	..	73	3	6·87	4·10	28
1851	Poona	1071	9	..	3	..	5	...	1	..	6	..	9	..	7	..	5	2	6	..	5	..	5	..	3	..	64	2	5.97	3·12	18
1852	Poona, Aden, and Bombay	1065	9	..	5	..	5	...	6	..	8	..	9	..	7	..	5	..	2	1	3	..	2	..	4	..	65	1	6·10	1·53	09
1853	Aden and Bombay	965	8	..	7	..	14	...	8	..	8	1	9	1	7	1	8	..	3	1	7	2	5	2	5	..	89	8	9·23	8·98	82
	Total		52	2	45	2	63	4	36	3	49	1	44	2	36	1	32	3	25	4	40	3	28	3	32	2	483	31	51·60	58·02	350
	Average for eight years		6.50	0.25	5.62	0.25	7.87	0.50	4.50	0.37	6.12	0.12	5.50	0.25	4.50	0.12	4.	0.37	3.12	0.56	5.	0.37	3.50	0.37	4.	0.25	60.37	8.73	6·3	7·25	0.37

The above return includes all cases of acute and chronic hepatitis. In addition 89 cases of icterus have occurred, 39 at Peshawur, 12 in the previous three years at Kurrachee, 12 at Poona in 1850, 13 in 1851, 9 in 1852 at Poona, Aden, and Bombay, and 8 in 1853 at the two latter places.

Hence it would appear that functional derangement of the liver prevailed to a small extent near the sea, and increased towards the inland provinces and the higher regions of the Deccan. In regard to organic affections, it is very striking the small difference in each year and at each station; but the casualties from hepatitis in the elevated and dry regions of the Deccan are considerably less than at the sea-side, as 10 to 21. This extraordinary difference I believe may be accounted for by the proclivity to hepatic disease being engendered by high living, elevated temperature, and unusual exposure. During the greater part of 1846 in Scinde the men were in tents, indifferently supplied with fresh vegetables, and hence a very large number of casualties occurred. It is true that in 1849 at Peshawur they were exposed even to higher temperature and an equally prolonged hot season, but there vegetables were abundant, ardent spirits not very easily procured, and hence although the admissions of hepatitis and icterus range high, the fatal cases were not numerous. During 1851 and 1852 the men were well accommodated and sheltered from the heat in spacious and commodious barracks, their diet was tempered with cool, refreshing, and wholesome vegetables, and instead of being limited to draughts of stimulating ardent spirits, they were liberally supplied with beer, porter, &c.; accordingly in 1850 there were only 3, in 1851 only 2, and in 1852 only 1 fatal case of disease of the liver. In 1853 the casualties are higher than in any other year, attributable I think to the facility with which ardent spirits are procured in Bombay.

The functional and organic disorders of the liver taken together amount to 572, which compared with the number of cases of fever will show 1 case of hepatic disease as occurring to about 13 cases of fever, but the chance of death is greater from 1 case of hepatitis than from 13 of fever. The deaths from

disease of the liver have been 4 annually, about 64 per thousand of treated, or about 4 per thousand of strength. Hepatitis has prevailed least in the months of August, September, October, January, and February.

Affections of the liver from their prevalence, urgency, insiduous manner of approach, complications, and in many instances fatal character, always demand the most serious attention. I have not always found the man in the greatest danger who comes to hospital complaining of acute pain under the ribs of the right side, shooting towards the shoulder, with great aggravation on moving, coughing, pressure, or deep inspiration, and with pyrexia and constitutional disturbance. When these symptoms are seen, the disease has not advanced so far but that it can be subdued by prompt and decided measures, such as general and local blood-letting, cathartics, mercury, counter-irritants, &c., assisted by low diet, &c. Obscure cases, coming on in a slow and insiduous manner, are likely to be less energetically treated, and often prove a source of much anxiety. They may succeed a more acute attack, after a patient has been discharged from hospital to his duty, or they may come on without any previous attack, and follow some error in diet, or a debauch, or be the consequence of costiveness or some irregularity of the bowels. There is little acute pain felt at first, but rather fulness, heaviness, or uneasiness in the right hypochondrium, for some days. Then the pain increases, is diffused or deep-seated, and referred to some spot near the back ; a dragging uneasy sensation upon turning on the left side not well borne, and the most easy position is upon the back. On examination there is some degree of tumefaction, and pressure increases the pain. The appetite is not good, and probably the bowels for some days have not been free. The urine is high-coloured, the tongue foul and loaded, disturbed sleep, but little or no fever. These symptoms yield, and apparently with ease, to the treatment, and convalescence is established, but after a time the complaint returns, or a bowel complaint supervenes, in the course of which hepatic symptoms again show themselves. The disease now becomes troublesome and dangerous, and most probably structural disease of the liver is making rapid progress,

or may already be considerable. The plan of treatment will depend much upon the state of health of the patient, and although the disease, if not checked, will terminate fatally, yet the constitution may be unable to bear the necessary measures. General depletion, if it can be borne, should be had recourse to, but the chief reliance is in local depletion, counter-irritants, evacuants, as occasion requires, and mercury; and if an abscess has formed, the strength must be sustained by generous, but not stimulating diet. In 1851 I forwarded to the Medical Board a very interesting case of hepatic abscess, successfully treated by puncture. As already mentioned, no case of jaundice has proved fatal in the eight years. They are generally treated by giving an emetic, and afterwards by purgatives and mercury to slight ptyalism; the subsequent debility by tonics, aperient bitters, mild nutritious diet, &c.

Return of Affections of the Bowels (Diarrhœa and Dysentery) in the 1st Bombay Fusiliers for Eight Years, commencing on the 1st April 1846, and ending 1st April 1854.

Year commencing 1st April.	Stations.	Average Strength of the Regiment.	April.		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio of Deaths to Treated.	Ratio of Deaths to Strength.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.					
1846	Kurrachee	709	61	1	24	1	38	1	25	..	50	1	43	1	36	1	19	3	13	1	15	..	11	..	14	..	349	10	49·22	2·86	1·41
1847	Kurrachee	813	25	..	25	1	18	..	21	2	39	..	20	1	15	1	12	..	14	..	24	..	33	..	31	3	277	8	34·07	2·88	0·98
1848	Kurrachee, and march to Mooltan and Peshawur	911	34	1	30	2	30	1	25	1	26	2	13	..	4	..	29	..	19	..	23	..	18	..	23	..	274	7	30·07	2·55	0·76
1849	Peshawur, and march to Poona	810	25	1	11	3	21	3	8	..	15	..	9	..	10	..	11	..	7	1	8	1	12	..	12	..	149	9	18·39	6·04	1·11
1850	Poona	1062	19	..	22	..	14	1	16	1	12	1	8	2	2	..	4	..	2	..	4	..	6	..	8	..	117	6	11.01	5·12	0·56
1851	Poona	1071	5	..	8	..	6	..	11	2	11	1	16	2	6	..	6	..	12	1	8	..	4	..	6	..	99	6	9·24	6·06	0·56
1852	Poona, Aden, and Bombay	1065	2	..	10	..	9	1	13	2	7	1	4	..	4	..	11	..	13	..	12	..	10	..	4	..	99	4	9·29	4·04	0·38
1853	Aden and Bombay	965	15	..	12	..	8	..	20	..	8	..	11	1	22	..	21	1	18	1	10	..	9	..	5	..	159	3	5·69	1·88	0·31
	Total		186	3	142	7	144	7	139	8	168	6	124	7	99	2	113	4	98	4	104	1	103	..	103	3	1523	53	166·98	31·43	6·08
	Average of eight years		23·25	0·37	17·75	0·87	18·0	0·87	17·37	1·	21·	0·75	15·50	0·87	12·40	0·25	14·12	0·50	12·25	0·50	13·	0·15	12·85	..	12·85	0·37	190·37	6·62	20·75	3·87	0·75

In this return, as in that of hepatic diseases, there is a strong exemplification of the evil effects of heating stimulating injesta, high temperature, and exposure in the production of disease. In 1846, when the regiment was in tents, and when the average strength was only 709, there were no fewer than 349 cases of bowel complaints, *i. e.* they amounted to nearly 50 per cent. of the entire strength. Ten proved fatal. In 1852, when the regiment was quartered in good barracks at Poona, the admissions were not 9 per cent. of the strength, and only 4 cases terminated fatally. During last year they have been more prevalent, both at Aden and Bombay, but no death is recorded under this head as having occurred at Bombay during fifteen months. The deaths annually have amounted to about 6½. The average of deaths per thousand of treated is about 34·80, and per thousand of strength about 7. January and February have proved the healthiest months.

Dysentery next to cholera may be looked upon as the most severe and fatal disease to which European soldiers in India are liable. In each year from 1846 to the present time, and wherever the regiment has been stationed, it has lost many men from this intractable and often insidious disease. The symptoms are generally these, and of some days' duration :—frequent purging, evacuations small, consisting of blood and slime ; straining when at stool, but little pain except a kind of cutting across the bowels and tenesmus. This cutting pain is referred to the umbilical region ; it is not increased by manipulation, although probably tenderness all over the abdomen on pressure is observed : perhaps there is only an obscure, sub-acute pain in the right or left iliac region. On examination of a recently passed stool, it is observed to be scanty, frothy, streaked with blood, but with very little feculant matter, without any very offensive smell. There is harshness and heat of skin, with thirst, and a white tongue. The symptoms rapidly get worse. Instead of the patient going to stool every few hours he goes every few minutes, and instead of it affording relief the *desiderium dejiciendi* is so great that he does not feel inclined to leave the place, or if he does, he immediately returns. The pain of abdomen increases,

is more constant; the smarting and tenesmus have been converted into an excruciating and constant pain, with a sense of fullness and heaviness about the anus, which nothing relieves, or rather these have been added to the straining. The stools are now composed of a small quantity of muculent fœces, tinged green or yellow, with a large admixture of blood; the pulse is hard and frequent, the skin hot and dry, the tongue parched and red; nothing relieves the thirst, and the more that is drunk the more frequent is the purging; there is no rest, and he requires assistance to move. The whole abdomen is tense and tender, and upon pressure the seat of the disease can easily be traced from the head of the colon along the arch of its sigmoid flexure to the rectum. The purging continues frequent, with the pyretic symptoms as before. By degrees, however, (that is, in from six to ten or twelve days, according to the urgency of the symptoms,) the pain or burning heat in the abdomen somewhat abates. The purging, although as frequent as before, is accompanied with less distress, and the stools contain less blood, resembling water in which raw meat has been washed. From the comparative relief now experienced the patient flatters himself with hopes of amendment. Unfortunately, however, other symptoms do not indicate improvement. The stools, although passed with less suffering, are still liquid, very frequent, and have a very offensive fœtor; there is still pain felt on pressure of the abdomen, the appetite does not improve, the thirst continues insatiable, the pulse is more frequent than ever, and has lost its strength, the tongue is covered with sordes, or is dry and red, the skin is bathed in a clammy sweat, and the strength is completely gone. In this state coma usually precedes death.

When a patient is admitted into hospital complaining of purging, with tormina and tenesmus, a dose of castor oil (with from twenty to thirty drops of tincture of opium, and from ten to twelve drachms of peppermint water) to clear the intestines of any acrid or irritating matter they may contain, is generally prescribed; should there be much tenderness of the abdomen or fixed pain in any particular part, the application of leeches and the abdomen to be well fomented are directed. After the castor oil has pro-

duced two or three copious evacuations, 10 or 20 grs. of calomel, combined with 2 grs. of opium, are given. Sometimes considerable advantage arises by giving a scruple of calomel with 4 or 5 grs. of extract of hyoscyamus over night, and the castor oil next morning. If the symptoms are not relieved, but on the contrary the pain of abdomen becomes more constant, with considerable constitutional disturbance, a general bleeding or another application of leeches as near the seat of pain as possible are ordered. Should the desired effect not, however, be produced, the venesection must be repeated, and local depletion persisted in till every vestige of pain is removed. It is very seldom blisters or counter-irritants in the early stages are desirable, as they may mask the symptoms, and thus lure into a false security, but when the disease has assumed a less acute or chronic character, of course they are had recourse to, and found very useful.

Whilst the tormina and pain of abdomen are thus treated by general and local depletion, anodynes, &c., the tenesmus is relieved by leeches round the anus, fomentations, hip baths, and emollient and anodyne enemata, and suppositories, repeated as may be required. *Bleeding* I consider the sheet anchor in dysentery; calomel and opium, ipecacuanha and purgatives, auxiliaries seldom to be depended upon alone. Unless in very urgent attacks, I prefer topical to general bleeding, because it has a more direct effect in relieving the congestion of the blood-vessels of the abdomen, and because it can be had recourse to more frequently without inducing such prostration of strength as inevitably follows general blood-letting frequently repeated. Phlebotomy, however, at the commencement of an attack, when the general constitutional derangement is great, or even afterwards when the patient's strength is equal to it, must be promptly and decidedly had recourse to, because in this disease, perhaps more than in any other, temporizing treatment is certainly succeeded by the worst consequences. Purgatives to remove any irritating matter or morbid secretion that may have accumulated in the intestines are given, and repeated from time to time. An emetic, unless

otherwise counter-indicated, is with the same view useful, and mercury to ptyalism proves an inestimable adjunct.

When the more urgent symptoms have been subdued, Twining's Pills are most valuable, and counter-irritants may be employed. If the dejections continued frequent, chalk-mixture or acetate of lead and opium are useful. Saturnine enemata are also found of great service in subduing tenesmus, and in removing the irritation and sub-acute inflammatory action in which the lower part of the intestines is involved. Subsequent debility is treated with tonics, &c., but the diet must be very cautiously and sparingly improved.

Return of Diseases of the Head in the 1st Bombay Fusiliers for

Year commencing 1st April.	Diseases.	Average Strength of the Regiment.	April.		May.		June.		July.		August.		September.	
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1846	Apoplexy and palsy	709	..	..	..	..	..	..	1	..	..	..	..	..
	Cephalalgia		7	..	3	..	10	..	1	..	12	..	5	..
	Delirium tremens		1	..	1	..	10	..	2	..	..	..	3	..
1847	Apoplexy and palsy	813	2	..	..	..	1	..	1	..	..	..	1	..
	Cephalalgia		19	..	15	..	15	..	6	..	11	..	8	..
	Delirium tremens		..	..	2	..	1	..	1	..	6	..	..	..
1848	Apoplexy and palsy	911	..	..	..	..	..	..	..	..	..	..	..	..
	Cephalalgia		10		12		9		1		3		3	
	Delirium tremens		..	..	..	..	..	..	..	..	..	..	..	..
1849	Apoplexy and palsy	810	..	..	..	..	..	..	1	1	7	4	..	..
	Cephalalgia		..	..	3	..	5	..	1	..	..	..	1	..
	Delirium tremens		..	..	..	..	2	..	..	..	6	..	..	..
1850	Apoplexy and palsy	1062	..	..	..	..	..	..	1	..	..	..	..	..
	Cephalalgia		4	..	6	..	6	..	1	..	3	..	7	..
	Delirium tremens		4	..	9	..	..	..	1	..	1	..	2	..
1851	Apoplexy and palsy	1071	..	..	2	..	1	..	1	..	..	..	1	1
	Cephalalgia		2	..	2	..	2	:	3	..	..	..	..	..
	Delirium tremens		12	..	4	..	4	..	7	..	12	..	3	..
1852	Apoplexy and palsy	1065	..	..	2	..	1	..	1	..	1	..	2	..
	Cephalalgia		3	..	1	..	5	..	5	..	4	..	8	..
	Delirium tremens		10	..	6	..	24	..	12	..	7	..	14	..
1853	Apoplexy and palsy	965	..	..	2	1	2	2	1	..	1	..	1	..
	Cephalalgia		2	..	3	..	3	..	2	..	1	..	2	..
	Delirium tremens		8	..	6	..	5	..	1	..	3	..	2	..
	Total		48	..	79	1	109	2	51	1	78	4	64	1
	Average for eight years		10·50	..	9·87	0·12	13·62	0·25	6·37	0·12	9·75	0·50	8·0	0·12

Eight Years, commencing 1st April 1846, and ending 1st April 1854.

October.		November.		December.		January.		February.		March.		Treated.	Died.	Total Disease of the Head.	Average of Treated to Strength.	Average of Deaths to Strength.	Average of Deaths to Treated.
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.						
..	..	..	..	..	..	1	..	1	..	2	..	5	..				
8	..	5	..	9	..	2	..	7	..	9	..	81	..	111	15·65	..	..
..	..	2	..	4	..	..	..	2	..	..	..	25	..				
..	..	..	..	..	..	..	..	..	..	..	..	5	..				
4	..	..	..	1	..	4	..	2	..	4	..	89	..	118	14·51	..	..
2	..	1	..	3	..	3	..	4	..	1	..	24	..				
2	..	..	..	..	..	..	..	..	..	..	..	2	..				
2		1						2		1		44		48	5·26	..	..
1	..	..	..	..	..	..	..	..	..	..	..	2	..				
..	..	..	..	1	1	..	..	..	..	..	..	9	6				
2	..	1	..	2	..	2	..	1	..	1	..	19	..	36	4·14	0·74	16·66
..	..	..	..	..	..	..	..	..	..	..	..	8	..				
..	..	..	..	1	1	..	..	..	..	1	1	3	2				
4	..	2	..	6	..	1	..	3	..	4	..	47	..	102	9·60	0·18	1·96
2	..	..	..	4	..	4	..	9	..	16	..	52	..				
..	..	..	..	..	..	..	..	1	..	..	..	6	1				
4	..	3	..	2	..	3	..	2	..	3	..	26	..	125	11·67	0·09	..
10	..	7	..	12	..	8	..	5	..	9	..	93	..				
..	..	..	..	..	..	..	..	..	..	..	..	7	..				
5	..	3	..	7	..	3	..	3	..	..	..	48	..	173	16·25	..	..
10	..	12	..	14	..	4	..	3	..	3	..	118	..				
..	..	1	1	..	..	..	..	..	..	..	..	8	4				
2	..	2	..	2	..	2	..	7	..	1	..	28	..	78	8·08	0·41	5· 0
1	..	2	..	1	..	2	..	7	..	5	..	43	..				
59	..	42	1	69	2	39	..	59	..	60	1	792	13	792	85·16	1·42	23·62
·25	..	5·25	0·12	8·62	0·25	4·87	..	7·25	..	7·50	0·12	99·0	1·62	99·0	10·62	0·12	2·87

In the foregoing return mental affections are not included, neither epilepsy, which is a rare disease. Three men only have been invalided on account of it, and no case has proved fatal. Cephalalgia seldom proves a troublesome complaint, and it is inserted in the return chiefly to show the most common form of disease of the head to which soldiers in India are liable. Of 45 cases of apoplexy and palsy that have occurred within the eight years 13 have proved fatal; 5 were from *coup de soleil* at Peshawur, and 2 at Aden.

The return shows 364 admissions from delirium tremens. Many of these would have been classed under ebrietas, had that name been in the catalogue of diseases. It was only in a moiety of the cases that the symptoms appeared in a severe form, with obstinate sleeplessness, tremors, restlessness, delirium, &c., and none proved fatal. Indeed, it is not very easy to comprehend how in a well-regulated regiment very aggravated or fatal cases could occur. The treatment in all cases consisted in unloading the stomach by a powerful emetic, then giving a cathartic, and afterwards a solution of tartar emetic to keep up nausea, and at bed time a dram of brandy. This method of treatment is continued for a day or two. In a few instances leeches were applied to the temples, or a blister to the back of the head when symptoms indicated their employment.

Return of Diseases of the Chest in the 1*st Bombay Fusiliers for Eight Years, commencing* 1*st April* 1846, *and ending* 1*st April* 1854.

Year commencing 1st April.	Stations.	Average Strength of Officers.	April.		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio of Deaths to Treated.	Ratio of Deaths to Strength.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.					
1846	Kurrachee	709	12	1	8	..	4		6	2	7	1	9	..	3	..	4	..	9	..	3	..	4	..	5	..	74	4	10·43	5·40	9·56
1847	Kurrachee	813	6	..	9	..	8	...	9	..	4	..	8	..	4	..	5	1	2	..	5	..	14	..	8	..	82	1	10.08	1·22	0·12
1848	Kurrachee, and march to Mooltan and Peshawur	911	11	..	15	..	6	..	3	..	6	..	6	..	4	..	9	...	9	..	10	..	4	1	2	..	85	1	9·33	1·17	0·10
1849	Peshawur, and march to Poona	810	3	..	4	..	7	..	6	..	6	..	5	..	8	..	5	..	6	..	2	..	2	..	2	..	56	..	6·91	..	..
1850	Poona	1062	5	..	10	..	7	...	6	..	6	..	10	..	7	1	12	1	9	..	13	1	10	..	16	1	111	4	10·45	3·60	0·37
1851	Poona	1071	10	..	9	..	2	...	12	..	7	1	10	1	9	..	6	..	17	1	17	..	8	1	4	..	111	3	10.36	2.70	0·28
1852	Poona, Aden, and Bombay	1065	9	..	15	..	6	...	15	..	11	..	23	1	13	..	11	..	8	..	9	..	6	..	16	1	142	3	13·33	2·11	0·28
1853	Aden and Bombay	965	9	..	13	..	5	1	11	..	7	..	9	1	3	..	4	..	4	2	2	..	2	..	4	..	73	5	7·25	6·85	0.51
	Total		65	1	83	..	45	1	68	2	54	2	80	3	51	1	56	2	64	3	61	1	50	2	57	2	734	21	78·14	23·09	2.22
	Average for eight years		8.12	0.12	10 37	..	5.62	0.12	8.50	0.25	6.75	0.25	10.	0.37	6.37	0.12	7.	0.25	8.	0.37	7.62	0.12	6.25	0.25	7.12	0.25	91.75	2.62	9·75	2·87	0.25

In this return there are no diseases peculiar to a tropical climate, and therefore the remarks may be brief. Four cases of cardiac disease have proved fatal, and if to these are added the 4 cases of sudden death out of hospital mentioned at page 152 and 1 case of aneurism of the abdominal aorta, 9 deaths in eight years from disease of the heart and large blood-vessels will have occurred—a portion by no means large out of the average strength. The other deaths were from diseases of the lungs, 10 being from phthisis.

At Kurrachee only 2 deaths occurred from thoracic complaints, which perhaps may be attributed to the beneficial influence of the sea coast. In 1849, notwithstanding the long marches, great exposure, &c., no death happened from disease of the chest. In the Deccan there was a larger number both of admissions and of deaths, and the predisposition was also increased. Ever since I joined the regiment its band has been very strong, but I have not observed that the musicians are more subject to disease of the lungs or heart than other men.

There still remains a class of diseases on which a few observations may be offered. Although only 1 death during the period under review is placed under diseases of the sexual organs, yet the extent to which the efficiency of a regiment is affected, the number of men constantly attacked, the deterioration of their constitutions and the consequent increased liability to future disease, (as well by the nature of the affection itself, as by the long confinement in a sick ward,) the losses to the State by men dying, by their being invalided on account of these complaints, as well as the expense incurred in the medical treatment, give to syphilitic diseases a very important place in the medical economy of a European regiment.

To show the prevalence of these diseases a return of them for the eight years is subjoined, as well as a daily return for the years 1851-52.

Return of Diseases of the Sexual Organs in the 1*st Bombay Fusiliers, commencing* 1*st April* 1846, *and ending* 1*st April* 1854.

Year commencing 1st April.	Stations.	Average Strength.	April.		May.		June.		July.		August.		September.		October.		November.		December.		January.		February.		March.		Total Treated.	Died.	Ratio of Treated to Strength.	Ratio to Sick in Hospital.
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.				
1846	Kurrachee	709	16	..	2	..	2	..	4	..	2	..	5	..	2	..	2	..	1	..	7	..	8	..	9	..	62	..	8·74	3·78
1847	Kurrachee	813	5	..	10	..	10	..	14	..	6	..	7	..	7	..	7	..	9	..	13	..	12	..	8	.	106	..	13·03	7·30
1848	Kurrachee, and march to Mooltan and Peshawur	911	6	..	13	..	13	..	7	..	10	..	25	..	21	..	71	..	35	..	32	..	34	..	17	..	279	..	30·62	16·99
1849	Peshawur, and march to Poona	810	19	..	16	..	16	..	15	..	28	..	10	..	15	..	16	..	35	..	23	..	14	..	10	..	216	..	26·66	9·21
1850	Poona	1062	54	..	45	..	45	..	38	..	23	..	25	..	37	..	25	..	35	..	20	..	20	..	41	..	441	..	41·52	15·44
1851	Poona	1071	20	..	32	..	32	..	29	..	33	..	31	..	53	..	21	..	15	..	24	..	23	..	24	..	332	..	30·90	17·33
1852	Poona, Aden, and Bombay	1065	25	..	30	..	30	..	41	1	34	..	30	..	36	..	52	..	40	..	43	..	25	..	11	..	394	1	36·99	16·96
1853	Aden and Bombay	965	7	..	5	..	5	..	10	..	5	..	6	..	6	..	13	..	10	..	13	..	13	..	18	..	112	..	11·60	6·69
	Total		152	..	162	..	154	..	158	1	151	..	139	..	177	..	207	..	178	..	175	..	149	..	138	..	1942	1	200·06	93·70
	Average for eight years		19·	..	20·25	..	19·25	..	19·75	0·12	18·87	..	17·37	..	22·12	..	25·87	..	22 25	..	21·87	..	18·64	..	17·25	..	242·75	0·12	25·	11·62

	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.	Average.	Ratio of Venereal Cases to treated.
Average daily sick from 1st April 1851 to April 1853	41	56	61	67	71	73	72	70	50	40	41	45	687	57	
Average daily return of venereal cases	17	16	18	19	21	18	15	17	12	10	13	15	181	15	26·3

The greatest number of venereal cases occurred in 1850, but on an average for the two years 1851 and 1852, 15 men were daily under treatment,—one-fourth more than the entire sick from other complaints. Judging from these returns, syphilitic affections prevail to a great extent in the large, long-established, and well-regulated cantonment of Poona. But the conservancy arrangements of that station are deplorably defective, and it is satisfactory to observe that in no other cantonment are these complaints so frequent.

Irrespective, then, of the deterioration of the constitutions of 15 men daily, from venereal affections, and of the diseases to which they indirectly give rise, it appears from the return given in a previous part of this report that upwards of 1½ men are annually invalided on this account, and likewise for the last return that 1 in the regimental hospital, and 3 absent from head quarters, died of them. The State has therefore in that period incurred a direct loss of Rs. 5,100, supposing each man to be worth Rs. 300, or 25 per cent. less than the highest price required to purchase a soldier's discharge from the service. To this must be reckoned the loss of the services of 15 men daily, the expenses whilst in hospital, and the charges for sending many away for change of air. When these items are added together, I have no doubt that the cost so incurred if properly and judiciously laid out, would not only prevent much bodily suffering, but prove a great pecuniary saving to the State.

In former times lock hospitals and lall bazaars were established wherever European troops were stationed. An outcry was raised against them on account of their supposed demoralizing character, and some even argued that instead of removing they increased the evil, and accordingly in 1835 they were abolished. Many of the lock hospitals were not well conducted, and the bazaars badly attended to; but even under the worst management it would be difficult to explain how they could increase the evil. The petty officials connected with them certainly took advantage of their position, and were often guilty of gross interference and imposition; but under better regulations these irregularities might be avoided. The question of

morality is one on which there will always be a difference of opinion, but in its consideration it must be borne in mind that Government does not encourage marriage, and only allows 12 per cent. married men in each regiment, and that this is the root of the evil. The point to be considered is whether it is better to preserve the soldier's health and efficiency, and to save the country from the loss of his services under well-conducted and efficient establishments, or to let him be exposed to the effects of sun and climate in seeking a gratification which entails disease, and renders him useless to the State for months together.

As Government has intimated its inability to correct the evil, I presume no assistance is to be expected from that quarter, but I know no better purpose to which the ample canteen funds could be applied. From these funds, under proper management, arrangements (which it is unnecessary to specify in detail) might be carried out, which would ensure protection from disease and the preservation of the health of the men generally.

MEDICAL TOPOGRAPHY OF MOHAMREH AND BUSSORAH.

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Presented by the Medical Board, July 1854.

On a former occasion I presented to the Medical Board a sketch of the medical topography and sanitary condition of Baghdad; I now propose to extend my remarks to Mohamreh and Bussorah, and the country generally, adding what may have been omitted in my former report, and giving the results of three more years' experience of the climate and diseases of Turkish Arabia.

Mohamreh, (lat. 30° 26′ N. and long. 48° 13′ 30″ E.,) now a Persian town, is situated on the Haffer Canal, which connects the Karoun River and the Shut-al-arab, at the distance of about half a mile from the latter. The population numbers about 4,000, most of whom are Persians and Arabs of the Chaab tribe. The town is situated on the north bank, enclosed by plantations of the date palm; the houses are small, the streets narrow and dirty, and the ventilation bad. The breadth of the Haffer at Mohamreh is about 200 yards; the tide rises and falls as much as 9 feet during the ebb, leaving a bank of filthy mud, consisting chiefly of decomposing animal and vegetable matter. Beyond the date plantations, both to the north and south, extensive marshes and rice-swamps exist. The chief occupation of the inhabitants is trading to Bussorah and the Persian Gulf.

Bussorah is situated in lat. 30° 31′ N., long. 47° 50′ E., on the right bank of the Shut-al-arab, at a distance of 80 miles from the sea. A narrow creek intersects the town in its whole

length, and as the rise and fall of the tide is nearly as great as at Mohamreh, the slimy banks are there also found, but giving forth a more noxious effluvium, from the greater quantity of refuse from the town. Bussorah has been a place of great importance and trade, but it is now a ruin. The population in 1840 was not less than 30,000, and now it has dwindled down to 6,000. The causes of this are partly physical and partly political, and doubtless the one has reacted on the other. Within the last twenty years a very extensive marsh has been allowed to form and remain on the north and west of the town, which in summer and autumn produces fevers of a most malignant nature, and which may perhaps be the reason why the town has suffered so severely from cholera on several occasions. The political causes of the decrease of population are insecurity of property, and the extortion of governors and tax-gatherers, which, combined with the unhealthy nature of the climate, have driven away many who would otherwise have remained, and have deterred others from settling in a place so unfavourable to health and trade. The population consists of Arabs, Persians, Turks, Jews, Abyssinians, and a few Indians. The town has been surrounded by a wall, but it is fast crumbling into ruins; it has a small garrison of regular troops, who have a barrack and hospital, with inferior medical attendance. An attempt has been made for some time to establish quarantine at Bussorah, but as yet it has only been partially successful. One cause of the failure has been the death of many successive officers sent from Constantinople to carry into effect the old-world ideas of the Sanitary Council of the Empire. The chief occupation of the inhabitants is trading with Baghdad, the Persian Gulf, and India. A considerable import and export trade in drugs is carried on; gums and gum-resins are brought from Baghdad, and shipped to India, and in return Indian medicines, spices, and dyes are carried to Baghdad and the north. There are some fruit gardens at Bussorah, producing pomegranates, apricots, figs, &c.; but the great produce of the place is dates, which are largely exported, and which form the principal revenue.

The climate of Mohamreh and Bussorah is very different from

that of Baghdad and the country to the north of the marshes. In the former the air is constantly loaded with moisture, which in summer acts like a vapour bath, producing and maintaining a copious and debilitating perspiration. I have made no extended thermometrical observations in this country, except at Baghdad, the mean annual temperature of which is 76°, the thermometer having an annual range of 90°; but in the lower parts of the country the actual temperature is not so high, although the heat is much more oppressive. In Bussorah the daily range of the thermometer is much less than at Baghdad; in the latter the nights are generally cool, even in the height of summer; in the former the nights are almost, if not quite, as hot as the days. The constitution, being worn out by the relaxing and enervating effects of this moist heat, and by the want of refreshing sleep, becomes more obnoxious to the influence of the malaria; and hence arise the fevers common during summer, but more general and fatal in autumn. The fever of this low swampy country is of a totally different character from that generally met with in the north. Intermissions are seldom seen, and remissions even are rarely obtained; organic visceral complications are almost universal, the liver and spleen being chiefly affected, and not unfrequently the disease assumes a malignant typhoid type. Should the patient recover from the first attack of the fever, it still lingers upon him for months, or even years, recurring at the new or full moon with the greatest regularity.

A vessel with an European crew visiting Bussorah between April and October would, in the course of a few days, have probably a third of the men on the sick list, as I have several times experienced in May and June; indeed, experience has shown that few Europeans can exist in Bussorah during the summer and autumn.

Cholera, too, has been more fatal in the south than in the north, and on two occasions it has lingered in the towns long after the epidemic had passed away, giving rise to a suspicion that it may now have taken up its abode there, and that it will occasionally break out when circumstances are favourable. As the situations of Mohamreh and Bussorah are similar, so are

their climates: situated on creeks, on a low alluvial soil, and surrounded by swamps, it is not to be wondered at that disease prevails, and that the mortality is great. In 1849 and 1850 a considerable party of Europeans was located at Mohamreh, where they were encamped on a dry plain, about a mile to the north of the town just outside the gardens; they suffered severely from fever, which proved very fatal amongst the escort of Turkish troops, but *all* were affected with a disagreeable complaint, to which they could assign no cause, and which no precautions could prevent. This was a constant vomiting after meals, which affected not only the party residing there, but also their visitors, who remained with them for a day or two. It at length became so general, and so distressing, that they gave up eating breakfast, and all became emaciated to a great degree. That this was not caused by anything deleterious in the diet was proved by the fact that two parties who had separate messes suffered equally, and that many of the men in one of the Honorable Company's vessels which was lying off Mohamreh suffered in the same way.*

Before the formation of the marshes above Bussorah the climate was tolerably healthy, and was not then, as now, dreaded and shunned by Europeans; indeed, for a series of years the East India Company had a factory there, and in later times a residency; and amongst their large establishments the mortality was by no means great. As, then, the climate was good before the formation of the marshes, we are entitled to suppose that it might again be rendered healthy by their removal, which would not be a work of very great difficulty.

It is fortunate, however, that at a short distance from Bussorah and Mohamreh more salubrious spots are to be found. Zobeir, which is not above nine miles from Bussorah, is situated on a hard, elevated, gravelly soil to the SW. of the marsh, and as the prevailing winds are the NW. and SE., it thus escapes from the influence of the malaria. Whether it be from

* An observation by Dr. Arnott respecting vomiting after meals is to be found at pages 31 and 32 of Vol. X. of the Transactions, as similarly affecting the Bombay Fusiliers in the Punjaub.—Secy.

this cause or from the nature of the soil, the climate is as different as possible from that of Bussorah. There are no plantations to prevent free ventilation, and the heat is dry, and not so oppressive; there fever is little known, and cholera has never been seen except as solitary imported cases. This is so well known to the inhabitants of Bussorah, that all whose means and circumstances permit retire to Zobeir in summer and when cholera makes its appearance.

So, at no great distance to the N. and E. of Mohamreh, you escape from the flat alluvial soil and the moist pestilential air of the marshes, to an elevated and dry region, where the climate is more conducive to health and comfort.

As the Mohamreh swamps do not extend far inland from the river Shut-al-arab, which here runs NW. and SE., by ascending the Karoun a short distance we escape from their influence. Subleh, which is a ruin about fifteen miles from Mohamreh, where the Karoun-al-aamah leaves the Karoun, appears to be as favourable a situation for a town as Zobeir, but by ascending the river further we get more into the high and dry lands.

The water of the Karoun has been famed from ancient times for its good quality, but in this country there is no want of that great essential. The waters of the Euphrates and Tigris are, when filtered, uncommonly pure, containing in solution a very small portion of the salts of lime; so also their tributary streams are pure; and if in inland tracts there is little water, it is merely from man's neglect, for there is no spot in all this country to which water might not be conveyed with ease, and indeed there is no spot to which it has not been carried in by-gone days, (as the ruins of magnificent canals attest,) when a man could travel from Hillah to Baghdad under the shade of plantations, and when there was *one garden* from Samareh to Bussorah.

Koovna is a small village of mud huts, placed in the angle between the Euphrates and Tigris at their junction, at a distance of 50 miles from Bussorah. The inhabitants suffer much from fever and cholera, and have a sallow, unhealthy appearance. The two rivers, by their confluence at this point, form the Shut-al-arab, a noble river, lined on both banks by ex-

tensive plantations of date palms. It has a course of about 130 miles to the Persian Gulf, and is navigable for ships of a large size. Between Koovna and Baghdad, on the Tigris, there is not a single town or village to be seen, and only a very few huts at Koot-al-amarah, about half way between the two places. From this spot a large canal, called the Shut-al-hye, runs to the south for 100 miles, carrying water from the Tigris to the Euphrates, which it enters about 15 miles to the north of Sook-esh-shinkh. This is an Arab town, with a population of 12,000, governed by the Shiekh of the Montifieck tribe; it is surrounded by a wall, and is a place of considerable political and commercial importance. Cholera in its different epidemics has always travelled from Bussorah to Baghdad by way of this place, from which it has exacted its usual number of victims. Fever, however, is neither general nor fatal, and Sook-esh-shinkh is reckoned healthy. From about 20 miles below this place to Koovna almost all the country between the two rivers is covered by water, which is poured out at various places by the Tigris and Euphrates, and so reduces the volume of the latter as to render the navigation very difficult. Hillah is a town with a population of about 20,000, situated in lat. 32° 28′ N. and 44° 27′ E., at a distance of 200 miles from Sook-esh-shinkh, and 60 miles south of Baghdad. The Euphrates at this place has a breadth of 385 feet, and is spanned by a bridge of boats, which connects the two portions of the town. Hillah is a walled town, is governed by a Turkish officer holding his appointment from the Phasha of Baghdad, and has a small garrison of regulars. There are some fruit gardens around the town, and the date plantations are extensive on the left bank of the river both above and below. It is a cleaner and better looking town than any in this country, and is reckoned the most healthy spot between the Hamrine hills and the sea, with the exception, perhaps, of Samareh. This town is situated on the left bank of the Tigris, in lat. 34° 11′ 33″ N. and long. 43° 53′ E. The alluvial soil here merges into the conglomerate; the situation is considerably higher than Baghdad, and being close to the Hamrine hills, and removed from marshes, it is somewhat cooler and considerably

more healthy than the other towns to the south. The population of Samareh is about 5,000, but varies in different seasons, as it is a favourite resort for pilgrims.

From the accounts of ancient authors it is inferred that formerly the climate of Mesopotamia was considerably different from what it is now. At that time there was far more cultivation, there were more plantations and gardens, and irrigation was practised on an extensive scale. These doubtless moderated the natural excessive heat of the climate, cooled the air, and induced genial showers in summer and autumn. Reasoning *à priori*, we can suppose that by changing the face of the country by means of irrigation and cultivation, we might also change the climate, and restore it to its former temperate and healthy condition.

It would be useless to enumerate the natural products of this country, for its capabilities are so great that almost any crop might be grown.

In elucidation of the most common diseases of this country, I append a list of all the cases treated by me in Baghdad during the years 1851, 1852, and 1853. Cholera, which has visited us twice in that time, has been omitted from the list, from the almost impossibility of noting every case. In 1851 it carried off between 3,000 and 4,000 people; in 1853 it was of such a mild nature that the total reported deaths amounted only to 72. In the list, all descriptions of fevers are grouped together, intermittent, remittent, and continued. In 1853 there was no inundation, and the amount of fever was less than in former years; indeed, the relation between the two is marked and constant.

Diseases.	1851.	1852.	1853.	Total.
Fevers	159	143	88	390
Diseases of the Eye	22	39	63	124
Dyspepsia	36	36	31	103
Bronchitis	20	29	39	88
Bilious attack	18	26	40	84
Cutaneous diseases	30	24	31	85
Diarrhœa	28	17	36	81
Rheumatism	33	21	24	77

Diseases.	1851.	1852.	1853.	Total.
Boils	18	9	15	42
Ulcers	11	18	11	40
Bruises	8	15	7	30
Headache	9	7	13	29
Gonorrhœa	12	10	5	27
Scrofula	11	10	6	27
Wounds, incised	9	9	5	23
Catarrh	7	6	9	22
Lumbago	6	5	9	20
Abscesses	8	6	3	17
Amenorrhœa	3	2	10	15
Dropsy, general	7	1	6	14
Cynanche tonsillaris	1	4	8	13
Tumours, non-malignant	4	5	4	13
Hysteria	7	3	3	13
Worms	3	2	8	13
Phthisis	1	7	4	12
Heart, diseases of	..	6	6	12
Scorbutus	1	5	3	9
Icterus	5	2	2	9
Dentition	4	3	2	9
Dysentery	4	3	2	9
Hœmoptysis	2	3	3	8
Hœmorrhoids	4	2	2	8
Orchitis	..	5	3	8
Syphilis primitiva	2	5	1	8
,, consecutiva	1	2	4	7
Pneumonia	1	2	4	7
Erysipelas	..	5	2	7
Fractures	4	2	1	7
Abortion	2	1	3	6
Spleen, enlarged	4	2	..	6
Uterus, diseases of	3	..	3	6
Hernia	5	..	1	6
Aphonia	2	2	2	6
Liver, disease of	3	3	..	6
Hemi-crania	..	4	1	5
Sciatica	2	1	2	5
Toothache	2	2	1	5
Wounds, contused	3	..	2	5
Fistula in Ano	2	..	3	5

Diseases.	1851.	1852.	1853.	Total.
Mesenteric disease	2	3	..	5
Caries	2	..	2	4
Dysmenorrhœa	1	1	2	4
Vertigo	2	1	1	4
Calculous diathesis	..	..	4	4
Impotence	..	2	2	4
Otitis	1	1	1	3
Paralysis	1	1	1	3
Sprains	2	1	..	3
Ulcerated throat	1	2	..	3
Wounds, lacerated	..	..	3	3
Cancrum Oris	3	..	..	3
Dislocations	1	1	1	3
Burns	..	..	2	2
Cynanche Trachealis	..	1	1	2
Catarrhus Vesicæ	..	1	1	2
Epistaxis	..	1	1	2
Stricture of Urethra	..	1	1	2
Synovitis	..	2	..	2
Tumours, malignant	..	1	1	2
Goitre	..	2	..	2
Gum-boils	..	2	..	2
Necrosis	..	..	2	2
Hæmaturia	1	..	..	1
Hydrocephalus	1	..	..	1
Hydrocele	..	1	..	1
Rubeola	..	..	1	1
Menorrhagia	1	..	..	1
Mania	1	..	..	1
Pleurodynia	1	..	..	1
Pleuropneumonia	1	..	..	1
Pertussis	1	..	..	1
Pleuritis	1	..	..	1
Polypus nasi	..	1	..	1
Wound, gunshot	..	1	..	1
Anus imperforate	..	1	..	1
Aneurism of Aorta	..	1	..	1
Anæmia	1	..	..	1
Ascites	1	..	..	1
Brain, disease of	..	1	..	1
Calculus in Ureter	1	..	..	1

Diseases.	1851.	1852.	1853.	Total.
Calculus in Bladder	..	..	1	1
„ in Urethra	..	1	..	1
Epilepsy	..	1	..	1
Enteritis	..	..	1	1
Fistula lachrymalis	1	..	..	1
„ in perinæo	..	1	..	1
	554	547	560	1661

All diseases of the eye, inflammatory and otherwise, have been classed together. Almost all the cases treated were Arabs; towns-people, particularly Christians, have their own oculists, in whom they put great reliance; the medicines which they prescribe are all used in the form of powder; the favourite is the oxide of zinc.

Under the head of "dyspepsia" are ranged all chronic derangements of the stomach and bowels not dependent on evident organic lesion. Of late years this has become a common complaint, especially amongst the inhabitants of the city.

The term "bilious attack" has been used as a convenient name for cases characterised by general malaise, loss of appetite, derangement of bowels, headache, or vertigo, and often light fever.

Regarding cutaneous diseases, nothing is worthy of remark except that psoriasis seems to be almost confined to the Jewish population. Diarrhœa is common in summer and the fruit season; on two occasions it has been very prevalent before and during an epidemic of cholera. When taken in time it has always been amenable to treatment. Cholera was always checked with pills composed of calomel, opium, and acetate of lead.

Rheumatism, as might be expected from the sudden and great changes of temperature, is common in winter, spring, and autumn, but I have met with very few acute cases; for these I know of no remedy equal to the vinum colchici when good, but unfortunately it does not keep well.

Dropsy, in two of the cases met with, was caused by disease

of the liver; in one it followed scarlatina,* in another it appeared as an acute inflammatory disease, and all the rest were dependent on organic changes of the heart.

A few years ago phthisis pulmonalis was almost unknown here, but of late it has become not uncommon, and now it appears to be on the increase. The antagonism of intermittent fever and phthisis used to be a favourite theory, but I believe it to be untenable.

The cases of scurvy which I have met with have been very mild, exhibiting only spongy gums, with rather a tendency to hœmorrhage from the intestinal canal. The best remedy which I have found for it is the chlorate of potash. Under "heart disease," six cases are noted; if to these we add ten which gave rise to dropsy, and are included under that head, we shall have sixteen. The most of these occurred amongst Jews, who seem to be more liable to this disease than the other races in Baghdad. I am quite unable to account for this, as there is nothing in their habits, occupations, or mode of life which would satisfactorily explain it. I have seen no connection between rheumatism and disease of the heart. None of the other diseases present anything worthy of remark.

As there is a probability of this country ere long becoming the seat of military operations, in which an Anglo-Indian army might be called upon to take part, it may not be thought supererogatory to mention, as the result of seven years' experience, what appear to be the best and most likely means of preserving health, and preventing disease.

As no extensive military movements could be carried on during summer on account of the heat, it would be advisable that any body of men coming here should arrive at the beginning of winter, and not at the end of it. From October to May the season is cool, and the climate is everywhere good; but from May to October exposure to the sun would be fatal, and even in tents the heat would be very trying to European constitutions;

* Scarlatina is a disease scarcely known in India, and it would be interesting to have cases, when met with, put upon record.—Secy.

indeed, if possible, European troops should be moved to the hills during summer, or if not, they should have airy and capacious barracks, cooled by tatties and punkahs. Excellent tatties can be made here at a very trifling expense; they consist of a light framework of date wood, filled up with camel-thorn, which grows everywhere in abundance. The camel-thorn should be renewed every month, as, being kept constantly wet, it soon decays, and becomes offensive. By these means tents even can be made wonderfully cool; all the requisites are in abundance: date wood and camel-thorn can be procured at an almost nominal price; the barrack or camp of course would have a plentiful supply of water, and there is generally enough of wind to carry on evaporation from the tatties.

Commonly the nights are cool, even after the hottest days, and although we occasionally have heavy dews, experience has not shown that sleeping in the open air has any injurious effect, if due precautions be taken to prevent a sudden chill and check of the perspiration; indeed, sleeping in a room would be impossible. As sound and refreshing sleep is desirable at all times, and after the exhausting effects of a hot day necessary for the preservation of health and vigour, and as sand flies and mosquitoes render sleeping near the ground very problematical, it would be well in this matter to follow the customs of the country, where all sleep on the tops of the houses during the five hot months.

In winter flannel and warm clothing are necessary, particularly for Indians, who suffer from cold, and are subject to rheumatic and pulmonary affections.

Twelve months after the arrival of an army in this country, probably half of the number would be suffering from the Baghdad boil, here called "date-mark," and as it generally attacks the hands and feet of adults, a considerable proportion might be incapacitated for duty. This is a disease from which scarcely a person escapes who resides here in autumn; it is devoid of danger, but tedious, and I know of no means of prevention or of cure.

It is unnecessary to enter more into detail on the sanitary

means to be adopted and the precautions to be used by an army in this country; they may be summed up in a few words. Mohamreh, Bussorah, and the low country should be avoided in summer and autumn; exposure to the sun in the months of June, July, August, and September should be guarded against, and the heat of tents or barracks should be mitigated as much as possible. During the months of December, January, and February, we have the opposite extreme to guard against. At that time flannel and warm clothing are necessary, and fires even might occasionally be used with advantage.

As it is always advisable to have a station at no great distance which might be used as a sanatarium for the more speedy and complete recovery of those affected with fever and chronic visceral complaints, we have for selection the whole range of the Luristan and Kurdistan mountains, the choice being determined by political considerations and the position of the army; the latter, however, need not have much weight, as the river is navigable as far as Samareh, which is only a few days' march from an eligible situation in Kurdistan. The Turks have no military sanataria in this Pashalic, but their hospital in Baghdad shows that the sick are not uncared for. The house was not originally built for the purpose, and of course it is defective in structure and design; but the wards, although small, are not overcrowded, and are always well ventilated; the strictest cleanliness is enjoined and practised; the hospital bedding and clothing are excellent, and the supplies of medical stores and instruments are on the most ample and liberal scale. These are procured from Paris, and are of the best description; but the instruments, scientific and surgical, do not seem to be much used; indeed, the Turk trusts more to his *kismut* than to the skill of the surgeon, and operations are rarely, if ever, performed.

To a former report I appended a list of some of the medicines found in the bazars of Baghdad, with their native names; since then I have become better acquainted with the Arab pharmacopœia, and I now subjoin a list of most of the articles used medicinally, with their English names (when known), and with the name of the country from whence procured.

Medicines procurable in the Bazars at Baghdad.

Officinal Names.	Countries.	Native Names.
Abietis Resina (?) ..	India	.. .. جام سقزی
Absinthium	Persia	.. .. افسنتین
Acacia	Baghdad.. ..	.. .. صمغ عربی
Acetum	Baghdad.. ..	.. .. خل ..
Acidum Arseniosum..	Europe	.. .. سم الغار
„ Nitricum ..	Baghdad.. ..	.. .. تیزاب ..
„ Sulphuricum..	.....	.. .. دهن کبریت
Acorus	India	.. عود الدفاد or عکر or وج
.....	Persia	.. .. قصب ضریره
Ærugo	Aleppo	.. .. زنجار جاون
Allium	Baghdad.. ..	.. .. ثوم ..
Aloe	India	.. .. صبر ..
Althæa officinalis ..	Baghdad.. ..	.. ختمی or ملوخیه
Alumen	Persia	.. .. شب ..
Ammoniacum ..	Persia	.. .. وشق ..
Ammoniæ Hydrochlo ras	India	.. .. شانامر ..
Amygdalus Dulcis ..	Baghdad.. ..	.. .. لوز ..
Amygdalæ Oleum ..	Baghdad.. ..	.. .. دهن اللوز
Anethum graveolens..	Baghdad.. ..	.. .. بزر ریحان
Anisum	Aleppo	.. .. انیسون ..
Anthemis nobilis ..	Persia	.. .. بابونک ..
Antimonii Sesquisul- phuretum	Europe	.. .. کحل ..
Aqua floris Aurantii..	Baghdad.. ..	.. .. ماے قدح
Argenti Nitratis ..	Europe	.. .. حجر جهنم
Armoracia	Baghdad.. ..	.. .. فجل ..
Asarum	Syria	.. .. اسرون ..
Assafœtida	Persia	.. جویفه or صمغ المحروث
Benzoinum	India	.. لبان or بخور جاوری
Borax..	Baghdad.. ..	.. .. بورق ..
Calx usta recens ..	Baghdad.. ..	.. .. .. لوه
Cambogia	India	.. .. ربراوند

Officinal Names.	Countries.	Native Names.
Camphora	India	.. .. .. كافور
Cantharis	India	.. .. .. درنوح
Capsicum	Baghdad.. ..	.. .. فلفل احمر
Carbo Ligni	Baghdad.. ..	.. .. .. فحم
Cardamomum ..	India	.. .. .. هيل
Carui	Baghdad.. ..	.. عزنايج or حبت حلوه
Caryophyllum ..	India	.. .. .. قرنفل
Cassia Fistula ..	India	قصب فلوس or خيار شمبر
Castoreum	.....	.. .. .. جند
Cera	Baghdad.. ..	.. .. .. شمع
Cinnamomum ..	India	.. .. دارجين
Coccus Cacti.. ..	Europe	.. .. .. قرمز
Colchicum	Egypt	.. .. سورنجان
Colocynthis	Baghdad.. ..	.. .. .. حنظل
Conium	.....	.. .. بنج رومى
Coriandrum	Baghdad.. ..	.. .. .. كزبره
Crocus sativus ..	Persia	.. .. زعفران
Cuminum Cyminum..	Baghdad.. ..	.. .. .. كمون
Cupri Sulphas ..	.....	.. .. .. زنجاره
Curcuma	India	.. .. .. كركم
Cydonia vulgaris ..	Persia	بزرسفرجل or بزرحيوه
Daucus Carota ..	Baghdad.. ..	.. .. .. جزر
Euphorbium	Persia	.. .. فرفيون
Extractum Glycyrrhizæ	Aleppo	.. رب انسوس or شيحه
Ferri Sulphas ..	.....	.. .. .. زاج
Ficus..	Baghdad.. ..	.. .. .. طين
Fœniculum	India	.. .. بادیان ططائی
Galbanum	Persia	.. .. .. قسنى
Galla..	Kurdistan ..	.. .. .. عفص
Gentiana	India	.. .. جنتيان
Glycyrrhiza	Baghdad.. ..	.. .. .. سوس
Granatum	Baghdad.. ..	.. .. .. رمان
Hydrargyrum ..	India	.. زيبق or سليمانى

Officinal Names.	Countries.	Native Names.
Jalapa	India	.. .. جلاب ..
Juniperus sabina (?) ..	Baghdad.. ..	.. .. ابهول ..
Kino	India	.. .. قاطر مكى
Lactucarium	Baghdad.. ..	.. .. خسس ..
Lemones	Baghdad.. ..	.. .. نومى حامض
Limonum Succus ..	Baghdad.. ..	.. .. ماے نومى
Lini Oleum	Baghdad.. ..	.. .. دهن كتان
„ Semen	Baghdad.. ..	.. .. بزركتان
Magnesiæ Sulphas ..	Europe	.. .. ملح فرنگى
Malva sylvestris ..	Persia	.. .. قدومه ..
Manna	Persia	.. .. منفرنجبى
Mastiche	Constantinople ..	.. .. مستكى
Mel	Kurdistan ..	.. .. عسل ..
Mentha piperita ..	Baghdad.. ..	.. .. فعناع ..
Morus	Baghdad.. ..	.. .. تكى ..
Moschus	.....	.. .. مسكه ..
Myristica	India	. .. جوزبوه
Myrrha	Mekka	.. .. مرمكى
Nux vomica	India and Persia..	.. .. جوزالقى
Oleum Menthæ piperitæ.. ..	Baghdad.. ..	.. .. دهن فعناع
„ Terebinthinæ..	Kurdistan ..	.. .. ترمتين
Olibanum	Kurdistan ..	.. .. علكه لبان
Olivæ Oleum ..	Asia Minor ..	.. .. دهن الزيت
Opium	Persia & Smyrna.	.. .. افيون ..
Opoponax	Persia	.. .. جوشير
Papaver	Persia	.. .. خشخاش
Piper. Cubeba ..	India	.. .. كباب جينى
„ nigrum ..	India	.. .. فلفل اسود
Porrum	Baghdad.. ..	.. .. كراث ..
Potassæ Bitartras ..	.....	.. .. ملح طرطير
„ Nitras ..	Baghdad.. ..	.. .. شوره ..
Prunum	Persia	.. .. الوبخاره
Quinæ Disulphas ..	Europe	.. .. كينه كينه

Officinal Names.	Countries.	Native Names.
Rheum	Smyrna	.. .. .. راوند
Rhœas Papaver. ..	Baghdad	. .. خشخاش احمر
Ricini Oleum ..	Baghdad	.. .. دهن الخروع
Rosmarinus . ..	Baghdad	.. اكليل حنه حبال
Ruta graveolens ..	Baghdad	.. .. حرمل ..
Sagapenum	India	.. .. سكبينج
Sarsa	India	.. .. .. عشبه
Scammonium ..	Egypt	.. .. سكمونيه
Senna	Mekka	.. . سنامكى
Sinapis	Baghdad	. .. .. خردل
Sodæ Carbonas impura	Baghdad	.. .. .. قلى
Sulphur	....	.. .. .. كبريت
Tabacum	Kurdistan, &c. ..	.. .. .. توتن
Tamarindus	India	.. .. تمرهندى
Tinctura Opii	....	.. .. .. تريالك
Tragacantha	Persia	.. .. .. كثيره
Zinci Oxidum ..	....	.. .. .. توتيه
Zingiber	India	.. .. زنجفيل

Substances not in the Pharmacopœia, but used medicinally in Baghdad.

Names.	Countries.	Native Names.
Arsenic, Yellow sulphuret ..	Persia	.. .. زرنيخ اصفر
„ Red Sulphuret.	India	.. .. زرنيخ احمر
Bastard Saffron (?) ..	Persia	.. .. قرطم ..
Betel Nut	India	.. .. فوفل ابيض
„ „	India	.. .. فوفل احمر
Black Cummin Seed ..	Baghdad	.. .. حبت سوده
Cocculus Indicus ..	Persian Gulf ..	.. .. زهرالسمك

Names.	Countries.	Native Names.
Dragon's Blood ..	India	.. .. دم‌الدخین
Endive	Persia	.. .. هندبا ..
Fenugreek	Baghdad	.. .. حلبه ..
Flea-wort	Persia	.. شبیوش or قطونیه
Gum Koondie ..	Kurdistan ..	.. .. صمغ کردی
Oil of Sesame ..	Baghdad	.. .. شیرج ..
Purslain	Persia	.. .. برین ..
Safflower	Persia	.. .. عصفر ..
Spikenard	India	.. .. سنبل طیب
Star Anise	India	.. .. بادیان ..
Sweet Basil	Persia	.. .. فرنجمشک
White Naphtha ..	Persia	.. .. نفط ابیض
No English Names.	Baghdad	.. .. بزرحشیش
	India	.. .. بزربنج ..
	Persia	.. .. خوبه ..
	Persia	.. .. باریتنک
	Mekka and Nejd.	.. .. بزربالیسان
		حب عصفور or حب بجور
	Kurdistan ..	.. .. or فلفل‌هوا
	Damascus ..	.. .. استاقدوس
	India	.. .. لسان‌الطیر
	Persia	.. .. بزرالدود
	Damascus ..	.. .. لعبت لظهر
	India	.. .. حبت عافیه
	Persia	.. .. قطب ..
	India	.. .. طشم ..
	India	.. .. پاپیته ..
	India	.. .. هلیلج کابلی
	India	.. .. هلیلج اصفر
	India	.. .. هلیلج اسود
	Persia	.. .. گول سرنگون
	Persia	. .. عنب‌الثعلب
	Persia . ..	.. .. عناب احمر
	Persia	.. عناب اسود or سبستان

Names.	Countries.	Native Names.
No English Names.	Constantinople	.. .. بزرصنوبر
	Baghdad..	.. .. بزرالنيل
	Baghdad..	.. .. بزرخيار
	Baghdad..	.. .. بزرعرف الديكه
	Baghdad..	.. .. بزرالياس
	Baghdad..	.. .. بزرجلجل
	Baghdad..	.. .. بزركرفس
	Persia	.. .. بزرمعدنوس
	Persia	.. .. بزررشاد
	Baghdad..	.. .. بزرنينيه
	Mekka	.. .. حضوض مكى
	Persia	.. .. عنزروت
	Persia	.. .. عنزوت كبه
	Persia	.. .. مشوكه..
	Persia	.. .. سرخشت
	India	.. .. صندروس
	India	.. .. بوال ..
	India	.. .. كات هندى
	India	.. .. عود ..
	Nejd	.. .. عود باليسان
	India	.. .. عودالصليب
	India	.. .. عودالليه
	.....	.. .. عود مشهل
	India	.. .. تربل مجوف
	Persia	.. .. عرق الحلاوه
	Syria	.. .. عرق اصفر
	India	.. .. قولنجان..
	India	.. .. لطر ..
	India	.. مامیران جنگلی ..
	India	.. .. تيواج خطايى
	Persia	.. .. هوه جوه
	India	.. .. جوپجينى
	Persia	.. كوزبان or لسان الثور
	Persia	.. .. افتيمون

Names.	Countries.	Native Names.
No English Names.	India	.. .. عكلة الفيل
	Baghdad	.. .. عكلة الزماد
	Aleppo	.. .. لحية الشيخ
	....	.. .. كركر ..
	Constantinople ..	.. .. غريقون
	Persia	.. .. تيهان ..
	Persia	.. .. ثعلب ..

REPORT

OF THE

NATIVE GENERAL HOSPITALS (CIVIL AND MILITARY) AT ADEN, FOR 1853-54.

BY J. F. STEINHAUSER, ESQ.,
Civil Surgeon.

Presented by the Medical Board.

AT the close of the official year ending March 1853 there remained 29 patients in the Civil Native General Hospital and 40 in the Military Native General Hospital. During the current year 1,216 patients have received medical attendance at the former hospital, and 1,070 in the latter, giving a total of 2,355 cases treated during the year. The casualties at both hospitals have amounted to 35 in number, *i. e.* at the rate of nearly 1½ per cent. of the total number treated. It should, however, be taken into consideration that the diseases encountered at the Civil Hospital are such as present themselves from a large fluctuating population presumed to amount to 20,000 souls. This station, moreover, may be considered as a halting place for pilgrims to and from Mecca from all parts of India ; Somalies further cross over from the African Coast for medical treatment, whilst the chief admissions into the Military Native General Hospital (where 1,597 individuals are entitled to seek medical aid) are from among the Government workmen (or biggaries), a body of men who take service at Aden when they cannot find employment elsewhere, and who leave Bombay without previous medical inspection. Among the new arrivals of the latter it is no uncommon circumstance to meet with old cicatrices from former ulcers on the legs and cases of dracunculus, which should never have

been allowed to proceed to a station where sloughing ulcer is a very prevalent disease. In confirmation of this opinion it may be casually mentioned that 30 men proved to be objectionable at a recent inspection of 200 new arrivals. It would be very advisable to subject the workmen engaged at Bombay for Aden to a superficial inspection by a hospital assistant, who should reject those who show old cicatrices on their legs, dracunculus, or other glaring infirmities. The chief diseases, taking them numerically, treated during the past year at both hospitals, have been fevers, ulcers, rheumatism, diarrhœa, dysentery, and scurvy, all which affections may be considered as very prevalent at Aden, being favoured in their development, and modified in their progress, by the peculiarities of the climate. Fevers are of daily occurrence during the entire year, and cannot be said to prevail at any given season. During the months of June and September the admissions were in the past year most numerous. The total number of fevers treated has been 505 ; the casualties under this head are 5 in number—about 1 per cent. of treated. Fever as it presents itself at Aden is not a very formidable disease. Among the Europeans it mostly assumes the bilious remittent type, intermittents being uncommon. Although this fever yields to active treatment, (emetics and purgatives, combined with calomel and antimonials, being the remedies chiefly to be relied on,) yet it often leaves the patient in a state of debility, from which he but slowly recovers ; the moist hot climate of this part of Arabia appears to be ill-adapted for convalescents from any disease. Among the native population fever presents itself as a quotidian intermittent or in the common continued form, accompanied by much derangement of the chylopoetic organs ; this, in fact, is the most frequent complication. A scorbutic diathesis is of very common occurrence at this station, hence fevers often present great difficulties in their treatment ; but taking the disease as it is usually met with among natives, it is easily and effectually combated by purgatives and emetics, followed by antiperiodic remedies during the intervals of the febrile paroxysms. The admissions from ulcers have been 355 in number, and the casualties from this cause 11—above 3 per cent. It is very difficult, however, to

arrive at an exact estimate of the number of these cases, because correctly speaking upwards of 550 have been treated: some admitted as dracunculus, others under the head of paronychia, phlegmon, contusions, and wounds. Few cases of breach of continuity, in fact, heal at this station without ulceration and sloughing. If all the 550 sloughing cases be classed together, the casualties must be recorded as 15 in number. No class of diseases presents such difficulties in the treatment, causes more anxiety to, and taxes the patience of the medical attendant, more than this affection. The ulcer is the true sloughing ulcer, to which is added a strong disposition to sphacelus. Its formidable nature is well known even to non-professional residents in Arabia under the name of the Yemen sore. The aged and young are equally obnoxious to attack, but women and children and Europeans are tolerably exempt. It rarely shows itself elsewhere than on the lower extremities. If it affect the hand, commencing as paronychia, the case will be tedious; but the patient may be considered fortunate, because the medical attendant can boldly predict recovery with the loss of one or two phalanges. Regarding a sore situated on the lower extremities, it would be unsafe to venture on any prognosis. It may, however, be safely asserted that when symptoms of gangrene appear, unless early amputation be resorted to, there is but a slight chance of saving the patient's life. When first seen, the sore is generally observed as a more or less circular ulcer, penetrating through the superficial integument to the fascia of the leg; its edges are raised and everted; its surface is covered with an ashy grey or a brownish slough. In this state it may remain for months, spreading slowly in circumference, or penetrating gradually more deeply, or in one night brownish fungoid elevated spots may present themselves on the surface of the sore, accompanied by intolerable fœtor, and in twenty-four hours after this one-half of the leg may be in a state of irremediable gangrene. The deep-seated muscles of the leg may become affected before the fascia covering them is destroyed. It may even sometimes become necessary to make free incisions into the apparently sound fascia, to give vent to confined fœtid dark-coloured sanious

discharge. Nothing can be more formidable than these untoward cases. The tibia may become affected, throw off irregularly corroded speculæ or large exfoliations; then become black through its entire cancellous texture, and at the same time so brittle that it may fracture as the patient turns in bed. Few of these cases recover. If the patient be young, vigorous, and healthy, the constitution may be able to bear up against the ravages of the disease and the deleterious effect of the absorption of the poisonous decomposed tissues. In that case a large portion of muscle, tendon, and integument, in a state of gangrene, will be thrown off, leaving a florid surface, secreting healthy pus, and a chasm in the structures of the leg, which it would be vain to expect to fill up with granulations under six or eight months. Of course the power or action of the muscles is then permanently impaired. This is, however, a favourable view, for few constitutions are able to resist the ravages of gangrene, nor are the young and vigorous patients entirely safe, as nothing is more frequent than relapse: the least indiscretion in using the limb suffices to cause a recommencement of gangrene. These ulcers are also very sensitive to the influence of the climate. Dry serene weather is most favourable to their progress towards a cure; a hot and damp day will cause sloughing, or even gangrene to appear in apparently healthy sores.

In the majority of severe cases the patient succumbs to the secondary effect of the disease, even if he bears up against the local injury. Quick thready pulse, colliquitive diarrhœa, hiccough, coma, death—such is the usual termination of the malignant form of the disease. It is difficult to assign a cause for these sores. They are chiefly met with among the ill-fed and hard-worked population. Thus, pilgrims who have been plundered by Arabs of all they possessed, and have exhausted the charity of the inhabitants of the town, present themselves thus affected for admission into the Civil Native General Hospital, and the biggaries who resort to the Military Native General Hospital are hard-worked men, whose dietetics are not very judicious: they mostly live on fish, which is easily procured, and—in a climate very favourable to the decomposition of

animal matter—not always good. That the climate of Yemen is both an exciting and predisposing cause of this affection, there can be little doubt. Some medical men consider them entirely of a scorbutic nature. That this is frequently the case, and that sores would become most virulent with such a complication, is apparent; but they cannot altogether be looked upon as cases of scurvy properly so called, because spongy gums will become firm, and hardness of the muscles disappear, under judicious treatment in a scorbutic thus affected, whilst the sore on his leg will remain inactive, or suddenly spread with fearful rapidity. Four of the worst cases, moreover, two of which proved fatal, presented themselves in the 3rd Company of Bombay Sappers and Miners before it had been two months at the station. This is surely too short a time for strong and healthy men to acquire a confirmed scorbutic diathesis. There is no remedy for these cases at present known. The slight cases in young and healthy subjects will recover under tonics and alteratives with the application of nitrate of silver, and with resinous and terebinthinate dressing. In severe cases nothing will save the life of the patient but amputation at an early period. Change of climate has been strongly recommended, and there is no doubt that the disease may be got rid of by exportation, but it is more than questionable whether change of air is equal to arresting the progress of gangrene. Strong nitric acid, which is generally so very useful in sloughing and phagedenic ulcers, appears to be hurtful in these cases, by penetrating to the bone, destroying the periosteum, and invariably giving rise to necrosis. The treatment by alteratives and tonics internally, and stimulating applications externally, such as nitrate of silver, sulphate of copper or red precipitate, with occasional emollient poultices to encourage the removal of the sloughs, offers perhaps the best prospect of effecting a cure. Purgatives and all antiphlogistic remedies do harm. With stimulants and opium a case of gangrene even may be palliated, and the life of the patient prolonged for a few days. It may, however, be considered as a rule that where reddish brown fungoid spots form on the surface of the ulcer; where the edges of the sore are hard and everted; where a dark-

coloured areola of two or three fingers' breadth is observed in the integuments around the sore; where the discharge is offensively fœtid and dark-coloured, and where the deeper seated muscles become affected, speedy amputation affords the only chance of saving the life of the patient. From three to twelve months may be considered the period during which a case of this description will remain under treatment. It is astonishing how little the general constitution suffers until gangrene is fairly established; but there is reason to suspect that where 2 or 3 cases of the severe form of this affection are collected together, gangrene will spread. By way of experiment, a case has been removed from one hospital to the other, (a distance of more than two miles,) but without arresting the progress of the disease.

The natives of Aden, *i. e.* the Arabs and Somalies, who are very subject to the slighter form of this affection, are in the habit of treating it by firmly binding a thin piece of sheet brass or copper, moulded to the form of that portion of the leg where the ulcer is situated, over the entire sore and part of the sound integument. This metallic covering answers the purpose of excluding the external air, protecting the surface of the sore from injury and from the pernicious effect of irritation by dust, dirt, and extraneous bodies, whilst the corrosion of the metal at the same time yields, after a rude fashion, an astringent and stimulating substance—a mixed oxide and acetate of copper—as a local application to the sore. In severe cases the metallic plate must be a fertile source of sphacelus.

Rheumatic affections are very common at Aden: the heat and moisture of the climate, and the high winds which prevail during the two monsoons, cause sudden variations of temperature, and greatly favour the development of this disease.

No less than 276 cases of this complaint have been under treatment; 2 casualties are recorded under this head, 1 from a rheumatic affection of the joint, terminating by metastasis in pericarditis, as a *post mortem* examination proved; the other should perhaps be more correctly considered as a case of beriberi.

The sudden and frequent alterations of temperature at this

station, which give rise to rheumatic affections, are also a predisposing cause of diseases of the bowels. Thus 108 cases of diarrhœa have been treated, and 86 cases of dysentery. Two casualties occurred from the latter disease, one in the acute, the other in a chronic form. In the months of October and November the admissions from this cause were most numerous. From the nature of the employment of the Government workmen as miners and masons, and in other manual labour on the public works, severe wounds and injuries must be of frequent occurrence. The records, acccordingly, show 153 admissions under this head; among which there appear 2 casualties, both in men affected with scorbutic cachexia. One death was from ununited fracture of the femur, the other from laceration of the soft parts with comminution of the bones of the foot by the fall of a large stone; the injury subsequently giving rise to and terminating in fatal gangrene. Among the most common diseases at Aden must be considered scorbutus. Why this should be the case, it is difficult to decide; but the fact is incontestable, however obscure the reason. Brackish water and a deficiency of vegetable food, combined with the influence of sea air, may to a certain extent explain the cause of the prevalence of this cachexia, which the exhausting effect of the climate probably favours; but fresh water and vegetables are very liberally supplied by Government when required, and native vegetables are freely brought into camp, and are always to be obtained by purchase at as reasonable a rate as at most of the stations in India. Yet scurvy is more frequently met with here than in India, and in an infinitely more severe form. Of this disease 103 cases have been admitted, of which number 5 were fatal. Of the treatment of this disease it may be observed that a judicious dietetic regimen is more effective than therapeutic means, fresh vegetables being far preferable to lime-juice; and that the salts of potash, first recommended by Dr. Garrod, however ingenious the theory which suggested their use, are found to be valueless in practice. Of venereal affections 140 cases have been treated successfully. Twenty-two cases of dracunculus (importations from Bombay) have presented themselves for treatment. One

fatal case is found under this head, but the man was at the time of admission suffering from scurvy, and the worm became the exciting cause of sloughing ulcer, which terminated in gangrene and death. One casualty is recorded under the head of pneumonia, and 1 under that of paralysis. The most fatal disease treated has been variola, of which 22 cases were admitted, and 4 died. The disease was of a severe nature, the cases being chiefly brought to hospital in the confluent form; but it appeared to be confined to the Arabs and Somalies, many of the latter, who do not bear disease well, having been conveyed to Aden from Berbera and the interior of Africa and Arabia for treatment. Exhaustion from extensive suppuration at the period of maturation appeared to be the cause of death in the 4 fatal cases. The admissions from this disease commenced from the month of August, and ceased in December entirely.

The important subject of vaccination has not been lost sight of. Including 79 prisoners at the Jail, the total number vaccinated has since the month of September amounted to 872, of which 21 cases were unsuccessful. The favourable result may be chiefly attributed to the care with which the operation was performed, and to the method of proceeding, viz. that of always taking fresh matter from the pustule. It is said that vaccination had never before been successfully performed at this station —an assertion which is certainly borne out by the hospital records. It is difficult to suggest a cause of prior failure, but if the lymph have been hitherto only forwarded by the Jennerian Society direct from London in the hot months of July, August, and September, as was the case this year, the cause is apparent. Vaccine lymph, like other animal secretions, is very prone to decomposition when favoured by heat and moisture, and although the two plates of glass surrounded by tinfoil afford a sufficient protection from atmospheric influence to transmit the matter in Europe, yet it is very questionable whether this method of preservation be capable of preventing its decomposition in a hot and damp climate like that of the Red Sea and Aden.

It would be advisable, therefore, to seal the edges of the glasses hermetically with a coating of collodian, gutta percha, or

coautchocu before sending them from England. The natives of this place (more especially the Hindoo population) are as prejudiced against the operation as those of India, but with the assistance of the political authorities a sufficient number of cases may probably be obtained to keep up vaccination during the entire year. The only question is, whether it be successfully practicable during the hot months. In the stations in Upper Scinde, and even in India, where the temperature is not as high, it is very difficult to ensure success during the hot weather. The Arabs and Jews, who have a dread of small-pox, have afforded the greater proportion of cases for vaccination. It would appear that inoculation is not practised at Aden. It is credibly reported that small-pox frequently rages like a plague among the inhabitants of the Arabian and African coasts of the Red Sea.

Intelligent native practitioners, who might depend on this station for medical stores and vaccine lymph, attached to Her Britannic Majesty's consulates at Jeddah and Massawa, would enjoy ample opportunities of combating the disease, of extending vaccination, and a wide field for generally spreading the benefits of medical science.

REPORT

ON

ADEN ULCERS, AS OBSERVED CHIEFLY AT THE MILITARY NATIVE GENERAL HOSPITAL, ADEN, FROM JULY 1853 TO THE END OF AUGUST 1854.

BY J. F. STEINHAUSER, Esq.,
Civil Surgeon.

Presented by the Medical Board.

"Jurh el Yemani" جرح اليماني *(Helcoma Yemenense)*, or "Yemen Sore," may be defined to be a sloughing ulcer, showing a strong tendency to proceed to mortification.

Its origin is as doubtful, and as deeply hidden in the darkness of antiquity, as that of any other local malady. Being a disease whose development depends on the conditions of poverty and hardship, it has seldom struck down the great and wealthy of the land. Yet as early as A. D. 540 the romantic career of the poet and hero Amru el Kays was terminated, after a succession of hardships, by this disease.

Again, in A. D. 754, when Mahomed Abu See Mahomed conquered Yemen with an army from Hejaz, he found the people suffering from mortifying sores to such an extent that, conceiving the disease to be contagious, he issued an order directing all the sufferers to be burnt alive. Fortunately, however, for those who would have become his victims, the conqueror died suddenly before his inhuman mandate could be executed. From that time to the present the disease has shown itself in Yemen with the same characteristics; the science of medicine has made no progressive movement among the Arabs, and even experience has thrown no new light on their empiricism. They still treat the

disease according to the tradition of their ancestors. When the Habbeh or pustule (according to the Native physicians) first appears, they usually apply the potential cautery in a circle round the spot, and those who advocate more heroic treatment excise the part. Some have even been found who adopt the barbarous method of breaking the bone above the seat of invasion, when the affection has penetrated to the phalanges of the fingers or toes. The common practitioners have many modes of treatment, equally simple and inefficacious. The most common, probably, is that of applying a plate of copper, or sheet-brass, closely fitted to the sore, to exclude the external air, whilst the secretion from the wound, oxydizing the metal, furnishes a stimulating and astringent application. Verdigris in various forms appears to be the favourite dressing. Beside this, they use Tutia, or Tutty, and apply and adhibit a variety of other drugs, vegetable and mineral, the specification of which belongs rather to the curiosities of medical experience than to a report upon the disease.

The "Helcoma Yemenense" extends from Aden to Gunfoodah on the Red Sea, and to the confines of Hadramaut on the NE. The country about Sanaa and the north is so little known that it is impossible to assign to it limits in that direction. That it does not extend into Hejaz is proved by a popular saying of the Bedouins—"Raytak bi Jurh el Yemani." "I have seen thee with the Yemen sore" is a common curse in the Holy Land of the Moslems. The people of Hejaz, Nejd, and the regions SE. of the Sinaitic peninsula, suffer indeed from "Nasur," or common ulcers, which appear principally on the legs, leading down to the shin bones, and are troublesome and tedious to heal; but they are strangers to the dreadful disease which affects their southern brethren. Strange to say, however, in the regions west of the Red Sea there is a sphacelating ulcer similar in its characteristics to that of Yemen. I have treated several Somalies of Habr Gehajis, and other maritime tribes, who left their native country infected with the disease, and we are informed by a modern African traveller that the disease extends as far north as the port of Jedda, on the eastern shore of the Red Sea. After describing the town, he observes :—"The Yemen sores are very common in

all the neighbourhood. This is a most terrible disease, if not attended to in time. The state of the blood appears to be much affected by the climate, and boils break out (often on the legs), which increase gradually, till at last they become large sloughing ulcers, which eat away to the bone. Mortification not unfrequently ensues, and then, if there be a man at hand skilful in the use of the knife and saw, you are in luck, though you lose a limb; if not, all is soon over."

Yet on the Arabian coast opposite Massowa the disease assumes a milder and more tractable form.

The Yemen ulcer, like that of Scinde and the North Western Provinces of India, shows itself in various degrees of severity, and is met with on various parts of the body, but generally in situations at a distance from the heart. They are more frequently seen on the lower than on the upper extremities; more frequently on the extremities than on the trunk. They present themselves in equal numbers in the hot and cold seasons of the year. They are chiefly met with among paupers, pilgrims, Arab and Indian coolies, Somalies, and those generally exposed to hardships, poverty, and fatigue. Women and children appear to enjoy a remarkable exemption from this disease.

Setting aside climateric influence, the predisposing causes of this affection must be sought in all circumstances which tend to lower or exhaust the vital or nervous energy, which primarily over-excite, and subsequently cause depression of arterial activity. Such would be fatigue, privation, exposure, &c. singly or combined. These may act locally, inducing diminished vitality, laxity or atony of the nerves and vessels of the part on which the affection shows itself, or internally and constitutionally producing derangement of the organism, accompanied by spanæmic and cacoplastic symptoms, or indeed dyscratic and cachectic disease. The exciting causes are all lesions, attended by breach of surface, as abrasions, contusions, wounds, burns, guinea-worms, or affections attended by spontaneous absorption of texture, such as results from furuncular inflammation, or simple ulceration.

The sores vary much in appearance and size, and follow no regular course, from the period of invasion to that of their termi-

nation—hence it is difficult to arrange them under classes, or to describe stages; but four forms or varieties of degrees of severity are so frequently met with that they may for convenience sake be considered as types.

The first form—the true type of "Helcoma Yemenense"—is an ulcer averaging from three to four inches in diameter, irregularly ovoid in shape, with thick and everted edges, of a dark unhealthy colour, showing on the surface fungoid granulations, disposed to bleed on slight pressure. On many of these granulations dark brownish-red sloughs may be seen, tinged with the blood exuded from the destroyed vessels. The ulcer is characterized by the peculiar fœtor of the discharge, which can be compared to nothing but the most noxious odours of the dissecting-room. Local pain is generally complained of. It rapidly proceeds from bad to worse, until gangrene supervenes. The cellular tissue between the muscles, even the interfascicular cellular tissue, and that of the sheaths of the vessels, and surrounding the nerves, is quickly destroyed. The muscles appear, as if prepared by dissection, of a dark colour; the tendons are pulpy and swollen; the discharge, originally thin, scanty, and ichorous, becomes profuse and dark-coloured, and announces the invasion of sphacelation, by changing its fœtor to an insufferable cadaverous stench. A wide blackish-brown portion of integument is observed to circumscribe the vicinity of the sore. The limb becomes œdematous, or emphysematous, from the formation and diffusion of the gases of decomposition, and crepitates under pressure. Unless vigilance be used at this period, maggots appear in the sore. The bone is seen at the base of the ulcer denuded of periosteum, either of a dead yellowish white, or blackened by the dark irritating discharge. It becomes brittle, breaking often on the slightest movement, and discloses the cancellous texture as black as charcoal throughout; often the fractured end of the bone protrudes from the dark sphacelating ulcer. The pulse becomes quick, small, and thready; the respiration laborious and hurried; the tongue dry and glazed, sometimes covered with a thick yellow fur, sometimes dry and brown, with red edges. Coma supervenes; the excretions are passed

involuntarily. Singultus, muttering delirium, or colliquitive diarrhœa usher in the termination of the suffering. Death has been known to occur in forty-eight hours after the first appearance of well-marked gangrenous symptoms. On the other hand, the patient has lingered on in this "living death" for fourteen days, diffusing pestilence around. This variety represents the disease in its worst, though by no means unusual form. At the same time, it is comparatively rare. Of 130 cases only 14 presented such symptoms of malignancy.

The next variety is an irritable sloughing ulcer, irregular in shape, and varying in depth according to the degree of preponderance of the process of absorption over the plastic power of the vessels. It presents an ashy-grey surface, caused by a layer of decomposed cellular tissue, through which the red base may be discerned; a few accuminated florid granulations rise from the surface, until they protrude through the attenuated slough; they are highly sensitive, and disposed to hæmorrhage. This ulcer is generally accompanied by constitutional symptoms—acceleration of pulse; a white, pale tongue; loss of appetite; and other signs of derangement of the stomach and bowels. It is very slow to granulate, and prone to extend by sloughing. This process is usually preceded by the formation of loose fungoid granulations. If, in the course of a few months, the ulcer heals by granulation, an irregular cicatrix, like that of a deep burn, is left. This is a common form of ulcer. Of 130 cases treated, 32 presented these characters.

In the third form, which may be termed an irritable sloughing ulcer, the sore is of irregular shape, with hard and everted edges. It is of a pale yellow colour, and covered with a viscid tenacious secretion, partly the *debris* of decomposed cellular tissue, partly the altered secretion from the vessels. Embedded in this secretion, one or more cutaneous nerves, not yet destroyed, may be observed running across the sore. Several rounded points of erosion, deeper than the base of the sore, attract attention; they, like the surface of the ulcer, are covered with the tenacious secretion, whence emanates a faint sickly fœtor, easily distinguishable from that of the true "Helcoma Yemenense." This ulcer is tardy in the process of healing, and demands extraor-

dinary attention to cleanliness. Before improving in condition it throws off a yellowish slough, leaving a florid superficies, covered with irregular spongy granulations, imbued with a copious purulent discharge. Like the former variety of ulcer, it is highly sensitive, and prone to extend. When deteriorating, the granulations become spongy, dark-coloured, and fungoid. It is accompanied by constitutional symptoms—a quick and small pulse; a white or yellowish-white tongue; and symptoms of general derangement. This is a common form among the working classes at Aden. Of 130 treated, 36 presented these symptoms.

The fourth type, which may be defined a simple indolent ulcer, is characterized by absorption of texture, and indisposition to granulate. It is usually oval or circular, and varies in size from half an inch to one inch in diameter. It is of a florid colour, with slight elevation of the margin; generally superficial, and not attended by constitutional symptoms. It yields slowly but steadily to local stimulating treatment, leaving a permanently dark discoloured cicatrix. Of all forms of the affection, this is most frequently met with. Of 130 cases treated, 48 exhibited these signs.

The most marked characteristic of all these four varieties is the strong tendency they evince to pass from the one phase into the other, or from bad to worse. They may be said to be ever vacillating between ulceration and death of the affected part. They are highly susceptible of atmospheric influence, deteriorating in appearance on damp hot days, improving in dry weather. When many of these cases are collected together, they are liable to glide rapidly from sloughing to gangrene, and are capable of generating a hospital epidemic. In a few aggravated cases observed under these conditions, the whole of the textures of the limb, without reference to structure, were converted into a pulpy soddened mass, and dropped from the bones, exhibiting the tibia and fibula in a state of necrosis, and of a dead white colour. Fortunately such formidable cases are rare.

Having premised that these ulcers are irregular in their course, it becomes necessary to inquire into the cause of this symptom. It is found in various modifying circumstances. Complications

such as scurvy, syphilis, and other cachexiæ necessarily render them less amenable to treatment. An accumulation of irritating undigested ingesta in the alimentary canal will frequently give rise to sloughing, or induce gangrene. Sometimes an attack of fever causes all granulations to disappear, leading to active sloughing, or even to symptoms of sphacelation. Mental depression, or indeed any depressing influence, may produce the same evil result. In cases of irritation of the stomach or bowels, only emetics and warm laxatives are admissible: an active purge has been known to prove hurtful. Local irritation by the dressing, or an accumulation of the secretion round the sore, may give rise to similar untoward symptoms. Cleanliness, and a just adaptation of the dressing to the varying phases of the sore, become conditions of extreme importance. Rest in the horizontal position is in all cases an indispensable rule. In treating the lower castes of Indians, their inattention to cleanliness offers one of the greatest difficulties to be overcome. They will not afford a washerman, or sacrifice a rag. Often the very covering they lay over the bandages of the affected limb has been found saturated with the fœtid poisonous discharge.

Before proceeding to the consideration of the treatment, the question presents itself whether the cause of the affection be local or constitutional. That in the milder cases absorption of texture may depend on diminished activity, and atony of the capillaries, is probable, as they yield to rest, and the application of metallic stimulants and astringents. But as every severe case is either preceded or accompanied by well-marked constitutional symptoms, such as acceleration of pulse, with diminution of its volume, a white or yellowish-white tongue, a yellow tinge of the sclerotics, loss of appetite, general restlessness, insomnia, diarrhœa, or constipation, or irregularity of the bowels in action, and frequently by febrile symptoms, the argument would be greatly in favour of a constitutional cause. They are, moreover, so frequently accompanied by cachectic complications, that in few cases is there room for doubt. It is therefore more a matter of speculation than of practical worth to inquire whether the ulcer precede the cachectic symptoms, or present itself at a

subsequent period. In no instance, however, has ulceration been known to occur in a scorbutic patient under treatment in hospital when the number of these cases is considerable. On one occasion of 153 patients in hospital, 101 were found to be affected with scurvy. Certain it is, that if a scorbutic patient be suffering at the same time from ulcer, the local affection will neither heal nor improve in condition until the cachexia is removed. On the other hand, all symptoms of scurvy may have yielded to treatment, yet sloughing proceed with increasing severity. This phenomenon has been frequently observed, and convinces me that Helcoma Yemenense is not necessarily, as a cursory observer might suppose, a scorbutic affection. The first indication in the treatment it is self-evident will be to remove the cause. But here the usual obstacle presents itself: confirmed cachexia is not either easily or speedily to be cured, whereas the progress of a sloughing ulcer on assuming a gangrenous condition is as difficult to arrest as rapid in development. The question which arises, therefore, is whether, by the removal of the affected limb, a certain cause of ultimate destruction may not be overcome, and whether the sufferer by this expedient would not be placed in a more favourable position for recovery. Patients naturally object to loss of limb, and unless they promptly agree, an operation becomes useless. Even in case of a speedy consent, various difficulties arise. If the cause of the local affection be cachexia, the patient is clearly in a very unfavourable condition for submitting to a grave operation: in addition to the cachectic disease, the system is called upon to contend against the shock of the operation, and the subsequent drain or debilitating effect of a lengthened period of suppuration. Under such disadvantageous circumstances, it is more than questionable whether the wound of the stump would heal by agglutination or first intention. Should gangrene have been fairly established before the operation is undertaken, the further perplexing consideration must be met, where shall amputation be performed? It must necessarily be undertaken in the sound parts, and it is impossible to divine how far the mischief may have already extended up the loose intermuscular cellular tissue, and that surrounding the vessels

and nerves of the limb. To wait for a line of demarcation is to expect that which will never take place. Amputation, in consequence, is liable to frequent failures, and not always justifiable. Should a case present itself where the first symptoms of gangrene are in the process of development, and the patient readily consents to loss of limb, it might be expedient to amputate if it were deemed necessary, to afford him the benefit of change of air, to gain time to combat the cachectic disease under which he is labouring. The removal of the limb above the seat of the disease precludes the possibility of its spreading by continuity or infection of neighbouring parts, and the absorption of decomposed tissues, and the fœtid sanious discharge, which reacts as a depressing poisonous agent on the organism. But, again, under the condition of the continuance of the cause, we cannot be sure that the stump will not be attacked by the same disease for the removal of which the patient has undergone a severe operation; and this is found practically to be often the case.

It follows, then, that the only safe mode of treatment would be, if possible, to delay the progress of the local affection, which bears with it the seed of certain death, until the constitutional defect could be remedied, or the patient placed in a condition to recover from the cachectic disease. Theory would suggest that it would be most judicious to destroy the affected part by escharotics, at the same time supporting the system by nutrient diet, and artificially increasing the activity of the heart and arteries by diffusible stimulants, while nature shall be left to effect the work of separating the dead from the living parts. But here the cachectic cause again interferes with the endeavours, and to rely on this plan of treatment is in grave cases practically found to be trusting to a doubtful expedient. Of numerous severe cases treated on this plan (when amputation had been rejected) in only one instance was the dead part thrown off. It consisted of the soleus and gastrocnemius muscles, with the tendo achillis, and a portion of the os calcis in a state of necrosis. In all other cases gangrene was found to spread more rapidly among the deep-seated textures from the part destroyed by the nitrid acid—the escharotic used for that purpose.

It appears, therefore, that in grave cases the treatment can only be palliative. Locally, incisions may be made into the mortified limb, short of the living textures, to give an outlet to the sanious decomposed discharge. Morphia may be beneficially adhibited with a view to allay pain, and act as a sedative, and the life of the patient may be certainly prolonged by the free use of stimulants; but a line of demarcation has never been observed to form.

For the less severe cases of the disease, where gangrene is imminent, but not fully established, much may be achieved on the plan of treatment above mentioned. Here the further progress of the disease may be arrested by the topical application of escharotic and antiseptic remedies, whilst the strength of the patient is kept up by nutritious diet and diffusible stimulants. Sedatives should at the same time be given, to induce sleep, and tranquillize the nervous system.

By these means the opportunity may be gained of placing the patient in a condition to benefit by a change of climate, or of combating the symptoms of cachexia by expedient and judicious remedies. In those cases of "Helcoma" more especially where small dark brown bleeding sloughs are observed on the superficies of the sore, which always indicate the danger of gangrene, everything depends on converting the surface of the sore into a dead insensible slough, supporting at the same time the system artificially, and allaying all irritability by sedative remedies.

For this purpose an escharotic is required. Nitric acid is by experience found to be uncertain, and too active in its operation, often giving rise to necrosis of the bone. Nitrate of silver, on the other hand, is insufficient. The caustic alkalies appear to be too potent, and are not easily manipulated or managed. But the liquor arsenicalis, undiluted, or diluted according to the urgency of the case, has been found to answer this intention. It is not capable of effecting a cure, but will arrest the local progress of the disease, and often afford time to rectify a cachectic diathesis. The slough, or rather the surface of the ulcer, whose vitality has been destroyed by the arsenical preparation, will after a time be thrown off, and if the tonic stimulating and alterative treatment

has improved the general health, the vessels of the affected part will respond, and the sore present a more healthy appearance. The pulse becomes fuller and less frequent, and the appearance of the tongue improves. Numerous florid suppurating granulations arise from the surface of the sore, and its everted margin is level with the adjacent cutis. If the sore be now carefully cleaned and dressed with a stimulating terebinthinated resinous ointment, the process of granulation is slowly carried on until the sore is healed, leaving an irregular cicatrix, and often, if near an articulation, producing, like the cicatrices of burns, a soft anchylosis. The state of the general health must never be lost sight of throughout the period of treatment, for a tendency to relapse is one of the characters of the disease. Should the granulations become soft and spongy, it may be necessary to stimulate the vessels with nitrate of silver or sulphate of copper in substance. Divers modifying circumstances may call for a variation in the details of treatment: œdema may frequently be relieved by bandaging, or the formation of a superficial slough may demand the application of nitrate of silver followed by emollient poultices; or where a scorbutic diathesis is observed, vegetable poultices may be beneficially applied. But, as a general rule, the most successful plan of treatment, after the dead slough has been thrown off, is to induce the sore to retrograde through the various phases it may have presented, or to alter the action of the vessels, so that the sloughing ulcer may present the character of simple excitement. After allaying the irritability of the vessels, the object will be to convert it into an indolent ulcer. Under these circumstances, few difficulties remain to be overcome: they yield steadily but slowly to stimulating local treatment.

Of 547 cases treated in the Military Native General Hospital during thirteen months, from July 1853 to the end of August 1854, 443 were discharged, 81 were sent away for the benefit of change of climate, and 23 died.

POSTSCRIPT TO ART. II.

"*Note on Dracunculus in the Island of Bombay.* By H. J. CARTER, Esq."

Presented August 5th, 1854.

IN the "Note" above-mentioned, I have described the microscopic worm which so closely resembles the young of the guinea-worm as existing in the tanks only, to which it must of course be confined during the dry weather; but since the rains commenced I have frequently been engaged in examining the *Mosses* and *Algæ* which only grow on the old walls, trees, &c. during the monsoon, and have almost as frequently seen among them precisely the same kind of worm. The probability therefore is, that it exists generally during the rains, though perhaps more in some localities than in others. It must also be dried up during the dry season, and return to life again during the following rains, unless it leave ova, which then become developed, for most of the tanks in the island of Bombay are annually dry for some weeks before the monsoon.

The wide-spread occurrence, then, of this little worm, if it be the cause of *Dracunculus*, may also account for the general occurrence of the affection; at the same time, if it be a fact, little hope can be entertained of the discovery of any preventive means which will lead to its general suppression.

DECENNIAL RETURN

OF THE

AGE, CASTE, COUNTRY, AND CASUALTIES, OF THE BOMBAY ARMY.

BY LIEUT. COL. G. I. JAMESON,
Military Auditor General.

Presented August 1853.

AGES.

Age.		1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total for Ten Years.	Average for each Year.	Per-centage of Deaths at each respective Age.
20 & 21 ..	Numbers.....	5466	6417	5863	6398	6516	7745	5993	3532	2382	1785	52097	5209·7	
	Deaths.....	199	192	149	137	199	64	48	41	30	31	1090	109·	2·092
22 ..	Numbers.....	3104	2832	2836	2579	3191	3016	2453	2484	2050	1477	26022	2602·2	
	Deaths.....	84	67	45	47	77	33	23	32	31	7	446	44·6	1·713
23 ..	Numbers.....	2862	3089	2963	2960	2753	3013	2872	2666	2529	1964	27669	2766·9	
	Deaths.....	82	70	50	54	78	33	23	46	44	21	501	50·1	1·810
24 ..	Numbers.....	2272	2642	2949	2856	2951	2480	2580	2690	2655	2429	26504	2650·4	
	Deaths.....	74	72	71	45	81	28	25	33	43	34	506	50·6	1·909
25 ..	Numbers.....	1875	2090	2402	2738	2823	2802	2151	2369	2270	2309	23829	2382·9	
	Deaths.....	66	70	42	42	82	28	21	37	26	28	442	44·2	1·854
26 ..	Numbers.....	1316	1595	1855	2342	2856	2595	2214	1902	2275	2230	21180	2118·	
	Deaths.....	45	52	24	36	87	21	25	29	35	21	375	37·5	1·770
27 ..	Numbers.....	955	1128	1540	1822	2324	2556	2226	2089	1790	2118	18548	1854·8	
	Deaths.....	29	28	38	37	75	28	32	38	30	29	364	36·4	1·962
28 ..	Numbers.....	585	778	973	1399	1809	2004	2206	2088	2017	1673	15532	1553·2	
	Deaths.....	39	23	28	27	60	27	24	45	27	24	324	32·4	2·086
29 ..	Numbers.....	508	532	688	912	1267	1504	1729	1991	1964	1872	12967	1296·7	
	Deaths.....	12	24	16	25	60	26	23	32	25	23	266	26·6	2·051
30 ..	Numbers.....	417	418	514	683	985	1260	1506	1651	1869	2001	11304	1130·4	
	Deaths.....	19	12	17	18	27	18	18	28	38	38	233	23·3	2·061
31 ..	Numbers.....	404	354	343	453	685	788	1014	1370	1571	1918	8900	890·	
	Deaths.....	9	8	8	9	19	17	17	28	24	33	172	17·2	1·932

32	Numbers	603	418	305	343	488	601	768	999	1311	1648	7484	748·4	
	Deaths	13	12	4	6	18	13	10	21	26	30	153	15·3	2·044
33	Numbers	842	541	372	285	355	404	546	687	946	1260	6238	623·8	
	Deaths	21	11	10	9	19	11	5	16	17	11	130	13·	2·084
34	Numbers	1004	735	476	315	281	287	376	535	641	973	5623	562·3	
	Deaths	32	17	8	6	8	3	5	8	19	15	121	12·1	2·151
35	Numbers	1144	1064	795	525	325	284	305	356	510	656	5964	596·4	
	Deaths	46	18	25	10	6	10	2	5	7	12	141	14·1	2·364
36	Numbers	1062	967	881	638	452	314	208	268	343	516	5649	564·9	
	Deaths	34	26	20	7	16	3	4	6	4	6	126	12·6	2·230
37	Numbers	968	1080	911	855	610	404	247	204	249	346	5864	586·4	
	Deaths	26	28	12	28	23	7	3	3	3	8	141	14·1	2·404
38	Numbers	952	835	923	757	834	601	376	289	213	265	6045	604·5	
	Deaths	35	14	34	27	24	9	6	1	4	3	157	15·7	2·597
39	Numbers	782	754	689	803	758	646	416	319	279	188	5634	563·4	
	Deaths	29	10	21	21	17	10	9	4	1	1	123	12·3	2·183
40	Numbers	645	772	704	690	912	756	604	382	281	249	5995	599·5	
	Deaths	35	20	18	26	21	12	6	9	3	3	153	15·3	2·552
41	Numbers	564	523	649	563	618	680	506	517	355	266	5241	524·1	
	Deaths	11	18	10	13	20	9	9	9	7	6	112	11·2	2·137
42	Numbers	581	465	418	575	566	475	456	419	493	322	4770	477·0	
	Deaths	14	12	14	14	15	14	7	8	10	5	113	11·3	2·368
43	Numbers	516	522	397	407	655	500	440	428	368	398	4631	463·1	
	Deaths	26	10	15	16	26	14	5	15	8	3	138	13·8	2·979
44	Numbers	364	419	420	339	411	503	378	368	356	351	3909	390·9	
	Deaths	20	7	11	10	11	3	3	6	8	6	88	8·8	2·251
45	Numbers	347	341	369	375	348	326	372	345	333	328	3484	348·4	
	Deaths	18	9	10	11	8	9	3	6	10	9	93	9·3	2·669
46	Numbers	280	286	271	317	327	261	258	348	316	278	2941	294·1	
	Deaths	11	7	6	8	16	6	..	7	12	5	78	7·8	2·618
47	Numbers	236	232	218	228	297	282	182	196	292	252	2415	241·5	
	Deaths	12	7	2	7	4	6	6	5	8	5	62	6·2	2·567
48	Numbers	179	184	213	202	213	247	168	121	146	204	1877	187·7	
	Deaths	5	7	11	2	8	1	1	3	4	6	48	4·8	2·557
49	Numbers	165	131	130	161	177	172	160	154	91	118	1459	145·9	
	Deaths	4	6	2	4	5	1	3	3	5	1	34	3·4	2·330

Age.		1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total for Ten Years.	Average for each Year.	Per-centage of Deaths at each respective Age.
50 ..	Numbers.....	142	128	92	123	173	127	111	128	95	72	1191	119·1	
	Deaths.....	8	4	1	2	4	..	..	8	5	1	33	3·3	2·770
51 ..	Numbers.....	92	99	92	79	94	121	59	79	73	56	824	82·4	
	Deaths.....	6	2	2	1	6	2	..	5	1	1	26	2·6	3·155
52 ..	Numbers.....	250	256	233	248	277	160	129	147	158	162	2020	202·	
	Deaths.....	6	8	1	2	19	12	..	4	2	1	55	5·5	2·722

CASTES.

Caste.	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total for Ten Years.	Average for each Year.	
Christians	328	310	331	333	351	353	354	347	369	386	3464	346·4	
Jews	327	324	322	322	317	290	289	286	303	330	3110	311·	
Musulmans	2937	2906	2993	3100	3265	3045	2981	2772	2763	2770	29532	2953·2	
Hindoos or Mahrattas	24617	24738	26024	27282	28884	26111	25376	24002	23352	23122	253508	25350·8	
Moochees	473	449	490	426	489	507	497	426	478	459	4794	479·4	
Purwaries or Mangs.....	3944	3703	3772	3963	4018	3662	3501	3341	3353	3357	36614	3661·4	
Baiders	..	23	26	25	25	24	26	28	49	50	276	27·6	
Parsees	..	11	12	19	15	17	18	17	17	35	161	16·1	

CASUALTIES.

Casualties.	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total for Ten Years.	Average for each Year.	Per-centage of Deaths at each respective Age.
Strength 1st January each year.	31472	32626	32464	33970	37331	37914	34009	32121	31219	30684	333810	33381·	
Enlisted	4020	2194	3966	3006	4504	1905	430	721	1074	904	22724	2272·4	
Received from desertion	24	45	18	43	33	12	8	7	3	6	199	19·9	
Received by transfer, &c.	366	1187	578	1193	731	1169	215	202	294	196	6131	613·1	
Total	4410	3426	4562	4242	5268	3086	653	930	1371	1106	29054	2905·4	
Deceased	1070	871	725	707	1142	478	366	541	517	427	6844	684·4	2·064
Deserted	489	395	419	490	656	308	125	132	111	102	3227	322·7	
Discharged	429	562	371	455	424	3853	470	339	402	288	7593	759·3	
Struck Off	145	422	188	393	397	304	229	248	239	98	2663	266·3	
Invalided	284	206	345	198	199	265	21	61	107	76	1762	176·2	·531
Pensioned	778	869	665	224	373	1492	194	296	418	211	5520	552·	1·665
Transferred	20	199	343	169	2041	288	154	188	111	79	3592	359·2	
Killed or died of wounds	41	64	..	6	1	3	61	27	1	..	204	20·4	
Total	3256	3588	3056	2642	5233	6991	1620	1832	1906	1281	31405	3140·5	
Strength 1st January each succeeding year	32626	32464	33970	35570	37366	34009	33042	31219	30684	30509	331459	33145·9	

COUNTRY.

Country.	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total for Ten Years.	Average for each Year.	Per-centage of Deaths at each respective Age.
Arabia	2	2	6	4	10	7	7	8	5	4	55	5·5	
Africa	6	7	3	3	3	2	1	2	2	1	30	3·	
Affghanistan	2	4	5	3	10	5	2	2	2	5	40	4·	
Bombay	42	46	54	60	60	48	49	51	41	42	493	49·3	
Concan	12421	12010	11959	13291	14435	13203	12781	12235	12118	12130	126586	12658·6	
Candeish	73	62	80	66	67	205	45	49	56	49	752	75·2	
Carnatic	260	185	205	201	231	173	179	181	200	217	2032	203·2	
Canara	..	38	432	32	24	16	21	19	15	20	617	61·7	
Cashmere	1	1	1	1	1	1	1	1	1	1	10	1·	
Deccan	2143	2050	2027	2255	2578	2432	2328	2227	2252	2310	22602	2260·2	
Guzerat	543	510	598	543	556	511	503	323	313	324	4724	472·4	
Hindoostan	16358	16803	17868	18378	18645	16745	16453	15481	15020	14780	166531	16653·1	
Nemar	..	..	..	..	..	..	..	..	..	1	1	·1	
Rajpootana	..	..	..	..	..	..	..	..	..	1	1	·1	
Scinde	12	13	9	16	8	8	1	10	14	12	103	10·3	
Khorasan	..	3	4	1	5	3	13	5	6	4	44	4·4	
Mysore	..	..	..	..	..	..	..	..	11	11	22	2·2	
Madras	238	243	266	258	290	275	251	265	266	255	2607	260·7	
Malabar	447	452	404	433	427	328	391	343	344	330	3919	391·9	
Malwan	66	25	39	13	6	15	2	1	2	1	170	17·	
Punjaub	12	10	10	12	7	12	14	16	16	11	120	12·	

ABSTRACT

OF THE

STRENGTH, ADMISSIONS INTO HOSPITAL, AND DEATHS AMONG THE HONORABLE COMPANY'S *EUROPEAN* AND *NATIVE* TROOPS AT THE DIFFERENT STATIONS IN THE BOMBAY PRESIDENCY.

The Returns of European Troops embrace a period of Twenty Years, viz. from 1*st January* 1830 *to* 31*st December* 1849, *the Native Troops for Twelve Years, viz. from* 1*st January* 1840 *to* 31*st December* 1851.

Presented by the Medical Board.

Abstract of the Strength, Admissions into Hospital, and Deaths among the Honorable Company's European *Troops at the different Stations in the Bombay Presidency, for* 20 *Years, from* 1*st January* 1830 *to* 31*st December* 1849.

		1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	Total.
Poona	Strength	254	237	244	1017	990	965	935	856	198	164	5807
	Admissions	505	490	416	2861	2179	2271	2372	2512	508	465	14579
	Deaths	5	2	3	24	19	17	26	44	1	6	147
Ahmednuggur	Strength	689	677	638	584	449	327	337	372	334	227	4634
	Admissions	1345	1326	1148	1143	769	583	777	1113	914	600	9718
	Deaths	31	9	18	16	16	18	9	9	14	13	153
Bombay	Strength	..	..	260	228	222	223	214	237	297	234	1925
	Admissions	..	..	655	590	448	473	557	874	794	754	5145
	Deaths	..	..	28	18	9	28	13	39	23	42	200
Belgaum	Strength	100	99	91	79	99	94	88	103	99	....	852
	Admissions	2	172	156	102	200	264	204	188	154	....	1442
	Deaths	1	4	1	2	3	6	2	9	2	....	30
Deesa	Strength	959	958	992	111	118	104	107	110	107	101	3597
	Admissions	1768	1708	2220	186	375	321	234	227	211	285	7535
	Deaths	13	18	3	8	6	9	2	4	....	4	67
Sholapore	Strength	104	103	118	94	110	103	96	104	106	....	938
	Admissions	189	167	245	158	281	262	271	316	228	....	2117
	Deaths	6	3	..	..	3	2	..	7	3	....	24
Bhooj	Strength	68	96	89	80	98	93	96	92	93	....	805
	Admissions	258	183	95	154	284	275	257	152	153	....	1811
	Deaths	1	4	..	2	17	11	3	1	2	....	41
Baroda	Strength	65	..	..	..	..	..	..	..	....	....	65
	Admissions	44	..	..	..	..	..	..	..	....	....	44
	Deaths	..	..	..	..	..	..	..	..	....	....	....
Kurrack	Strength	..	..	..	..	..	..	..	..	308	312	620
	Admissions	..	..	..	..	..	..	..	..	152	427	579
	Deaths	..	..	..	..	..	..	..	..	3	36	39

Colaba	Strength	..	..	..	..	..	..	..	..	534	....	534
	Admissions	..	..	..	..	..	..	..	..	1699	....	1699
	Deaths	..	..	..	..	..	..	..	..	44	....	44
Aden	Strength	..	..	..	..	..	..	..	..	....	394	394
	Admissions	..	..	..	..	..	..	..	..	....	720	720
	Deaths	..	..	..	..	..	..	..	..	....	21	21
Kurrachee	Strength	..	..	..	..	..	..	..	..	....	94	94
	Admissions	..	..	..	..	..	..	..	..	....	167	167
	Deaths	..	..	..	..	..	..	..	..	....	5	5
Indus Army	Strength	..	..	..	..	..	..	..	..	....	400	400
	Admissions	..	..	..	..	..	..	..	..	....	686	686
	Deaths	..	..	..	..	..	..	..	..	....	58	58

		1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	Total.
Poona	Strength	554	1087	1385	1050	95	115	187	233	746	610	6062
	Admissions	1741	3671	4310	2820	390	326	525	659	1931	1368	17741
	Deaths	38	26	94	32	7	7	8	9	9	23	253
Ahmednuggur	Strength	187	290	316	270	177	149	162	438	389	368	2746
	Admissions	471	829	833	690	692	393	417	1045	946	1176	7489
	Deaths	10	9	16	9	21	2	5	8	7	15	102
Bombay	Strength	216	263	365	385	232	181	105	117	140	182	2186
	Admissions	815	819	1157	1293	995	514	534	436	425	698	7686
	Deaths	41	21	62	49	90	13	16	21	14	31	358
Belgaum	Strength	..	..	..	..	781	880	804	..	....	666	3131
	Admissions	..	..	..	..	2858	2170	1381	..	....	219	6628
	Deaths	..	..	..	..	30	38	30	..	....	5	103
Deesa	Strength	91	69	103	105	869	763	133	109	98	102	2442
	Admissions	199	4	301	307	1710	1490	322	346	259	279	5217
	Deaths	7	1	4	5	27	15	2	2	7	2	72
Sholapore	Strength	..	..	..	..	..	..	..	77	99	99	275
	Admissions	..	..	..	..	..	..	..	162	228	246	636
	Deaths	..	..	..	..	..	..	..	3	2	....	5

		1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	Total.
Bhooj	Strength	68	..	..	434	..	..	..	101	103	....	706
	Admissions	85	..	..	1085	..	..	..	100	92	....	1362
	Deaths	3	..	..	13	..	..	..	1	....	....	17
Baroda	Strength	..	..	..	..	..	..	..	..	....	....	....
	Admissions	..	..	..	..	..	..	..	..	....	....	....
	Deaths	..	..	..	..	..	..	..	..	....	....	....
Kurrack	Strength	262	255	222	..	..	..	..	..	....	....	....
	Admissions	408	261	9	..	..	..	..	..	....	....	....
	Deaths	16	..	..	..	..	..	..	..	....	....	....
Colaba	Strength	..	..	541	..	..	..	..	..	....	....	541
	Admissions	..	..	1023	..	..	..	..	..	....	....	1023
	Deaths	..	..	47	..	..	..	..	..	....	....	47
Aden	Strength	429	354	98	98	86	..	773	732	467	475	3512
	Admissions	766	474	111	106	34	..	305	1389	858	580	4623
	Deaths	26	8	3	1	1	..	8	36	13	6	102
Kurrachee	Strength	95	107	162	435	78	469	1003	935	1042	....	4326
	Admissions	180	289	412	1728	377	1129	2673	1883	1357	....	10028
	Deaths	2	6	21	55	13	15	158	15	25	....	310
Indus Army	Strength	332	294	277	..	..	..	..	..	....	....	903
	Admissions	260	425	656	..	..	..	..	..	....	....	1341
	Deaths	7	10	21	..	..	..	..	..	....	....	38
Mhow	Strength	..	..	107	103	94	97	102	..	....	....	503
	Admissions	..	..	262	236	208	165	47	..	....	....	918
	Deaths	..	..	11	6	1	5	2	..	....	....	25
Hydrabad	Strength	..	..	..	229	293	194	497	..	....	....	1223
	Admissions	..	..	..	1169	1271	32	770	..	....	....	3242
	Deaths	..	..	..	58	56	1	12	..	....	....	127
Kolapore	Strength	..	..	..	..	..	..	..	97	100	95	292
	Admissions	..	..	..	..	..	..	..	231	287	359	877
	Deaths	..	..	..	..	..	..	..	..	2	4	6
Punjaub Army	Strength	..	..	..	..	..	..	..	..	1246	1239	2485
	Admissions	..	..	..	..	..	..	..	..	640	4276	4916
	Deaths	..	..	..	..	..	..	..	..	9	63	72

Table exhibiting the Strength, Admissions, Deaths, and Ratios of Deaths to Strength per 1000, *for* 20 *Years, from* 1830 *to* 1849 *inclusive, among the Honorable Company's European Troops.*

Stations.	Strength.	Admissions.	Deaths.	Ratio of Deaths to Strength per 1000.
Belgaum	3983	8070	133	33391
Aden	3906	5346	123	31490
Deesa	6039	12752	139	23017
Poona	11922	32320	400	33551
Kurrachee	4420	10195	315	71266
Bombay and Colaba	5786	15553	649	125144
Hydrabad	1223	3242	127	103843
Ahmednuggur	7380	17207	255	33552
Sholapore	1213	2753	29	23907
Bhooj	1511	3173	58	38385
Baroda	65	44	....	....
Kurrack	1256	1257	55	43789
Indus Army	1303	2027	96	73676
Mhow	503	918	25	49701
Kolapore	292	877	6	20547
Punjaub Army	2485	4916	72	28973
Total....	52687	120647	2482	47108

General Abstract exhibiting the Strength, Admissions, Deaths, and Ratios of Deaths to Strength per 1000, *for* 20 *Years, from* 1830 *to* 1849 *inclusive, among H. M.'s and the Honorable Company's European Troops in the Bombay Presidency.*

Stations.	Strength.	Admissions.	Deaths.	Ratio of Death to Strength per 1000.	Order of comparative Healthiness.
Belgaum	15101	26086	416	27547	4
Aden	6002	8282	180	29990	6
Kirkee	12786	22676	348	27217	3
Deesa	18695	32122	642	34338	7
Poona	37967	87451	1564	41193	10
Kurrachee	15653	32617	1412	90266	14
Bombay and Colaba	16244	41287	1774	109209	15
Hydrabad	2389	8827	562	235244	16
Ahmednuggur	7380	17207	255	34552	8
Sholapore	1213	2753	29	23907	2
Bhooj	1511	3173	58	38385	9
Baroda	65	44	....	....	..
Kurrack	1256	1257	55	43789	11
Indus Army	1303	2027	96	73676	13
Mhow	503	918	25	49701	12
Kolapore	292	877	6	20547	1
Punjaub Army	2485	4916	72	28973	5
Total....	140845	292520	7494	53207	

Abstract of the Strength, Admissions into Hospitals, and Deaths among the Honorable Company's Native *Troops at the different Stations in the Bombay Presidency, for* 12 *Years, from* 1st *January* 1840 *to* 31st *December* 1851.

		1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total.
Aden ..	Strength	1425	1123	1249	1099	808	..	..	..	..	..	..	..	5704
	Admissions	1028	2288	900	602	124	..	..	..	..	..	..	..	4942
	Deaths	34	55	28	9	..	..	..	..	..	..	..	..	126
Ahmedabad	Strength	1954	2342	2572	2494	1715	2254	2633	2638	2113	2082	1772	1691	26260
	Admissions	2684	3672	3048	3045	1765	2276	2903	2720	2538	2702	2201	1959	31513
	Deaths	22	17	46	40	23	14	96	46	14	15	38	22	393
Ahmednuggur	Strength	195	246	382	289	1172	1460	1987	1705	1434	1314	1174	1245	12600
	Admissions	320	296	409	464	2352	1691	2262	1607	1567	1429	1087	929	14413
	Deaths	6	2	6	5	36	19	29	9	11	10	9	3	145
Asseerghur	Strength	..	..	1172	1182	1125	961	1096	995	938	800	518	507	9274
	Admissions	..	..	230	798	704	684	926	885	728	451	378	385	6169
	Deaths	..	..	2	4	6	9	10	5	2	1	1	..	40
Balmeer	Strength	340	371	374	449	384	..	..	..	..	..	..	..	1918
	Admissions	324	325	184	292	176	..	..	..	..	..	..	..	1301
	Deaths	3	6	4	20	3	..	..	..	..	..	..	..	36
Baroda	Strength	2132	2240	1877	1778	1555	1860	1705	1657	1761	1004	1591	1519	20679
	Admissions	3269	3543	2307	3196	2300	2184	4032	2734	1976	1264	2056	1642	30503
	Deaths	25	23	22	20	13	13	113	18	11	8	22	17	305
Belgaum	Strength	..	..	..	..	..	..	308	2254	2038	1279	1953	1300	9132
	Admissions	..	..	..	..	..	..	178	1398	862	543	1916	965	5862
	Deaths	..	..	..	..	..	..	4	22	18	14	20	10	88
Bhewndy	Strength	305	359	360	372	359	349	358	376	369	322	252	164	3965
	Admissions	205	217	154	175	154	167	199	201	196	134	115	91	2008
	Deaths	6	9	8	11	6	5	11	9	10	7	5	2	89
Bhooj	Strength	1138	840	721	772	1247	1141	1029	959	901	940	809	800	11297
	Admissions	1225	424	597	1821	1312	796	2353	1067	705	729	1165	1239	13433
	Deaths	10	8	16	12	18	12	11	8	8	7	7	12	129

Bombay	Strength	3357	2374	2149	2469	3298	3534	2630	2995	2647	2325	2314	2713	32805
	Admissions	3669	3819	2954	2859	3946	4018	3444	3887	3117	2602	2372	2479	39166
	Deaths	174	58	84	60	56	69	113	18	31	49	50	47	809
Broach	Strength	300	326	313	276	358	299	387	548	547	420	253	270	4297
	Admissions	428	389	300	433	373	368	576	624	247	465	431	490	5124
	Deaths	7	2	6	7	2	13	11	13	2	2	7	3	75
Dapoolee	Strength	552	772	835	741	950	688	669	649	531	394	337	344	7462
	Admissions	273	388	458	499	684	361	175	207	170	117	100	141	3573
	Deaths	8	13	8	12	22	14	6	5	4	7	5	5	109
Deesa	Strength	1117	1169	1231	1108	1154	1419	1174	1561	1318	899	1016	1004	14230
	Admissions	1270	1525	1143	1189	1366	1777	751	1561	1160	694	913	758	14107
	Deaths	21	12	9	15	13	10	16	23	7	3	6	9	144
Dhurumgaum	Strength	1101	1422	1383	1336	1316	1566	1581	1642	1195	883	693	750	14862
	Admissions	395	553	595	577	445	590	795	872	785	728	552	644	7533
	Deaths	1	1	7	7	2	9	24	4	5	6	6	6	78
Dhoolia	Strength	126	168	237	263	281	545	323	336	282	977	1079	934	5651
	Admissions	32	62	52	69	81	269	108	69	23	371	565	505	2206
	Deaths	1	1	..	4	5	4	3	3	..	1	8	4	34
Hursole	Strength	336	393	161	245	275	182	120	..	..	..	..	57	1769
	Admissions	448	644	293	268	226	122	175	..	..	..	..	75	2251
	Deaths	2	3	3	6	..	..	..	..	..	..	..	..	14
Hydrabad	Strength	..	..	..	4642	6815	5145	5630	3901	2608	2041	1886	2039	34707
	Admissions	..	..	..	16344	9008	7145	7677	3618	2336	3139	2375	2073	53815
	Deaths	..	..	..	335	120	86	95	35	38	48	23	30	810
Indus Army	Strength	4178	7186	7621	2896	..	..	..	..	..	..	..	..	21881
	Admissions	6261	14196	14007	4642	..	..	..	..	..	..	..	..	39106
	Deaths	63	246	404	81	..	..	..	..	..	..	..	..	794
Jerruck	Strength	..	..	..	..	..	..	1145	1529	1108	968	813	625	6188
	Admissions	..	..	..	..	..	..	1476	1718	644	634	706	502	5680
	Deaths	..	..	..	..	..	..	44	17	10	15	8	6	100
Kaira	Strength	672	639	608	578	829	1010	1052	1017	957	919	..	..	8281
	Admissions	534	442	324	396	1130	879	1061	935	588	454	..	..	6743
	Deaths	9	7	8	11	12	11	36	35	2	3	..	..	134
Karrack	Strength	624	743	120	..	..	..	..	..	..	..	..	..	1487
	Admissions	737	596	14	..	..	..	..	..	..	..	..	..	1347
	Deaths	5	10	..	..	..	..	..	..	..	..	..	..	15

		1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	Total.
Kansba	Strength	155	152	96	140	..	..	..	..	..	..	..	..	543
	Admissions	133	208	95	105	..	..	..	..	..	..	..	..	541
	Deaths	3	1	..	..	..	..	..	..	..	..	..	..	4
Khanghur	Strength	..	..	..	..	..	..	..	800	1636	1073	1401	1469	6379
	Admissions	..	..	..	..	..	..	..	1040	1096	1542	1308	2024	7007
	Deaths	..	..	..	..	..	..	..	6	10	12	2	11	41
Kolapore	Strength	..	..	..	..	1040	967	..	1694	1741	1509	928	973	8852
	Admissions	..	..	..	..	192	226	..	2170	1421	1653	673	959	7294
	Deaths	..	..	..	..	12	1	..	13	16	11	6	8	67
Kurrachee	Strength	1768	1341	1266	1502	4145	5941	7064	6365	4029	2847	1991	2304	40063
	Admissions	2854	1846	1634	3825	4820	4367	7461	4438	3188	1857	2000	2081	40371
	Deaths	41	27	40	39	83	124	476	68	75	29	38	39	1074
Larkhana	Strength	..	..	..	..	494	759	970	1048	1034	938	543	279	6065
	Admissions	..	..	..	..	1158	1515	730	703	1123	1154	400	242	7025
	Deaths	..	..	..	..	10	11	4	8	6	7	3	1	50
Mahableshwur	Strength	72	75	80	75	86	84	88	90	97	103	96	113	1059
	Admissions	78	42	40	96	88	87	45	60	86	46	50	96	834
	Deaths	..	..	..	..	..	1	..	..	..	..	..	..	1
Malligaum	Strength	1215	979	1534	1124	1109	..	1197	2017	1595	911	916	888	13485
	Admissions	1460	911	906	715	99	..	1167	1363	838	478	677	466	7080
	Deaths	8	6	17	3	1	..	36	11	1	10	6	6	105
Mhow	Strength	4261	3822	3608	3291	2728	2254	2105	..	..	..	..	..	22069
	Admissions	3885	3229	4941	3175	1979	1643	367	..	..	..	..	..	19219
	Deaths	24	53	42	32	16	38	14	..	..	..	..	..	219
Nassick	Strength	..	..	..	..	..	1097	427	..	424	454	128	96	2626
	Admissions	..	..	..	..	..	582	546	..	92	538	127	2	1887
	Deaths	..	..	..	..	..	5	18	..	..	5	1	..	29
Neemuch	Strength	..	..	..	..	..	..	..	..	..	..	1356	1320	2676
	Admissions	..	..	..	..	..	..	..	..	..	..	1568	1014	2582
	Deaths	..	..	..	..	..	..	..	..	..	..	8	11	19
Nusseerabad	Strength	..	..	..	..	..	..	..	..	..	..	1893	1928	3821
	Admissions	..	..	..	..	..	..	..	..	..	..	2684	2250	4934
	Deaths	..	..	..	..	..	..	..	..	..	..	28	11	39
Punjab Army	Strength	..	..	..	..	..	..	..	..	6183	6124	2470	..	14777
	Admissions	..	..	..	..	..	..	..	..	2769	12812	335	..	15916
	Deaths	..	..	..	..	..	..	..	..	20	139	10	..	169

Poona	Strength	2695	1883	2981	2803	3043	3985	3807	2527	2166	2061	2039	2210	32200
	Admissions	2684	1567	1973	2002	3586	4533	3559	2558	1471	1334	1930	1796	28993
	Deaths	39	11	25	11	46	63	48	10	10	14	20	20	323
Porebunder	Strength	108	108	108	105	109	126	106	..	..	..	..	..	770
	Admissions	55	90	134	114	41	123	86	..	..	..	..	..	643
	Deaths	..	..	3	5	..	8	..	..	..	..	..	..	16
Rajcote	Strength	1299	884	981	1412	1363	1355	1346	1555	1498	1298	1126	1116	15233
	Admissions	2361	919	811	1814	2039	1640	1663	1342	1455	1618	1662	1577	18901
	Deaths	14	6	8	15	12	9	12	7	6	9	7	14	119
Rutnagherry	Strength	..	..	..	..	362	763	239	..	..	297	307	292	2260
	Admissions	..	..	..	..	97	1011	72	..	..	93	197	278	1748
	Deaths	..	..	..	..	1	3	..	..	..	2	4	1	11
Sattara	Strength	1070	333	731	1008	866	1028	912	996	904	904	925	719	10396
	Admissions	700	27	1147	2209	905	507	495	512	678	553	740	450	8923
	Deaths	6	..	23	10	1	10	11	3	1	7	4	2	78
Seroor	Strength	238	261	179	232	278	193	251	595	234	279	217	247	3204
	Admissions	172	113	192	342	234	123	198	182	177	194	189	281	2494
	Deaths	..	..	..	1	1	1	7	1	..	2	3	4	20
Shikarpore	Strength	..	..	..	..	..	..	2343	1681	1685	1891	1693	1798	11091
	Admissions	..	..	..	..	..	..	3153	1657	1580	4064	1509	2321	14284
	Deaths	..	..	..	..	..	..	25	21	22	26	16	28	134
Sholapore	Strength	..	..	..	..	..	..	..	1272	1405	1339	878	835	5729
	Admissions	..	..	..	..	..	..	..	1937	1355	1229	454	317	4734
	Deaths	..	..	..	..	..	..	..	11	5	8	3	3	30
Sukkur	Strength	..	..	..	..	..	..	2967	1513	978	1147	1439	1007	9053
	Admissions	..	..	..	..	..	..	4092	1605	1130	1922	1216	1703	11668
	Deaths	..	..	..	..	..	..	27	23	8	24	13	9	104
Surat	Strength	798	758	862	837	742	898	878	939	781	692	773	768	9726
	Admissions	1501	1498	1107	1123	757	617	648	609	896	728	734	796	11014
	Deaths	13	5	16	17	9	8	8	7	2	12	24	12	133
Tanna	Strength	534	457	411	358	420	460	578	596	443	435	448	388	5588
	Admissions	370	398	238	316	327	624	970	414	488	508	525	288	5406
	Deaths	5	1	6	2	2	2	5	4	3	6	5	2	43
Vingorla	Strength	..	..	..	..	1014	441	553	..	..	295	297	296	2896
	Admissions	..	..	..	..	848	440	207	..	..	26	7	175	1703
	Deaths	..	..	..	..	22	7	1	..	..	..	..	1	31
Wagotun	Strength	..	..	..	..	..	..	..	..	..	..	25	38	63
	Admissions	..	..	..	..	..	..	..	..	..	..	29	13	42
	Deaths	..	..	..	..	..	..	..	..	..	..	..	..	..

Note to Hospital Admissions, &c. of Native Troops.

Aden.—Since April 1844 garrisoned by Madras Troops.

Asseerghur.—From January 1840 to August 1842 occupied by Madras Troops.

Balaneer.—This out-post was withdrawn in November 1844.

Belgaum.—From 1840 to 1845 occupied by Madras Troops.

Hursole.—The sick of the detachment from 1847 to 1850 were incorporated in the returns of the Head Quarters.

Hydrabad.—Occupied by Bombay Troops since 1843.

Jerruck.— Ditto ditto 1846.

Kaira.—Guzerat Provincial Battalion, converted into Guzerat Police Corps in 1850.

Karrack.—The Bombay Troops withdrawn in 1842.

Kansba.—The Detachment withdrawn in 1843.

Khanghur.—Occupied by Bombay Troops in 1847.

Kolapore.—There was no British Cantonment till 1844, when the insurrection broke out. From November 1844 to March 1845, and from October to December 1845, the Bombay Troops were stationed, and these were relieved by those of Madras, who occupied the Station till 1846.

Larkhana.—Occupied by Bombay Troops since 1844.

Malligaum.—From March 1844 to April 1846 occupied by Madras Troops.

Mhow.—Since April 1846 occupied by Bengal Troops.

Nassick.—There is no record prior to May 1845; the sick from January 1847 to February 1848 were incorporated with the Head Quarter Returns for Asseerghur.

Neemuch.—Occupied by Bombay Troops since 1850.

Nusseerabad.— Ditto ditto.

Porebunder.—The sick were incorporated in the Head Quarter Returns since 1847. This out-post was finally withdrawn in February 1851.

Rutnagherry.—From 1840 to September 1844, and from April 1846 to Febbruary 1847 occupied by Madras Troops; after this the sick of the detachment for 1847, 1848, and 1850 partly incorporated with those of the Head Quarters of the Corps.

Sattara.—From September 1840 to October 1841, the returns of the Wing had been forwarded to Regimental Head Quarters.

Shikarpoor.—Occupied since 1846.

Sholapore.—From 1840 to 1846 occupied by Madras Troops.

Sukkur.—Occupied by Bombay Troops since 1846.

Vingorla.—From 1840 to 1843 occupied by Madras Troops; the sick of the detachment for 1847, 1848, and 1850 were incorporated with those of the Head Quarters of the Corps.

Wagotun.—Occupied by Bombay Troops since 1850.

TABLES OF MORTALITY IN BOMBAY,

FOR SIX YEARS,

VIZ. 1848, 1849, 1850, 1851, 1852, AND 1853 ;

Prepared from the Mortuary Returns.

Table No. 1 shows all causes of death, among both sexes, and in all castes (except still-born).

Table No. 2 the number of male and female deaths amongst the different castes.

Table No. 3 the number of deaths at different ages, from all causes, and amongst all castes, of both sexes. This Table is divided into two parts, A and B, the former extending over the years 1848, 1849, and 1850, and the latter over the years 1851, 1852, and 1853, when a different division of ages was adopted.

No. 1.

Diseases.	1848			1849			1850			1851			1852			1853			Total.			Average.		
	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total
Cholera	42	27	69	1357	912	2269	2840	1889	4729	2383	1637	4020	697	438	1135	797	542	1339	8116	5445	13561	1352	907	2260
Small-pox	450	406	856	192	170	362	653	643	1296	262	255	517	520	487	1007	310	339	649	2387	2300	4687	397	383	781
Measles..	43	42	85	5	4	9	9	16	25	48	50	98	57	49	106	66	65	131	228	226	454	38	37	75
Fever	2682	2628	5310	3014	2582	5596	2992	2580	5572	2425	2380	4805	3020	2909	5929	3228	3055	6283	17361	16134	33495	2893	2689	5582
Disease of Nervous System ..	301	204	505	323	229	552	384	302	686	347	259	606	370	223	593	291	222	513	2016	1439	3455	336	239	575
,, Vascular ,, ..	8	5	13	11	2	13	7	..	7	14	2	16	15	3	18	9	..	9	64	12	76	10	2	12
,, Respiratory ,, ..	605	494	1099	716	534	1250	956	743	1699	818	672	1490	926	797	1723	1034	820	1854	5055	4060	9115	842	676	1519
,, Alimentary ,, ..	1017	705	1722	1107	782	1889	1078	780	1858	1099	821	1920	1064	801	1865	1168	812	1980	6533	4701	11234	1088	783	1872
,, Urinary ,, ..	19	2	21	15	2	17	14	1	15	11	1	12	16	3	19	16	2	18	91	11	102	15	1	17
,, Sexual System and Child-bearing ..	7	129	136	11	90	101	3	62	65	4	68	72	..	119	119	1	147	148	26	615	641	4	102	106
,, Locomotive & Tegumentary Systems..	71	34	105	28	11	39	20	9	29	29	14	43	41	14	55	21	7	28	210	89	299	35	14	49
Cachexy, Debility, & Syphilis ..	365	227	592	326	125	451	366	195	561	277	186	463	337	208	545	362	256	618	2033	1197	3230	338	199	538
Leprosy, Tuberc. and Artic. ..	31	21	52	36	9	45	45	16	61	44	9	51	22	12	34	33	13	46	211	78	289	35	13	48
Dropsy	119	136	255	123	106	229	106	98	204	130	100	230	119	98	217	71	46	117	668	584	1252	111	97	208
Accident and Violence	98	31	129	128	26	154	89	46	135	106	21	127	88	26	114	117	45	162	626	195	821	104	32	136
Other and unknown Cause ..	14	12	26	14	3	17	23	10	33	16	3	19	20	13	33	18	9	27	105	50	155	17	8	25
All Causes.. ..	5872	5103	10975	7406	5587	12993	9585	7390	16975	8013	6476	14489	7312	6199	13511	7542	6380	13922	45730	37135	82865	7621	6189	13810
Cholera, Small-pox, and Measles.	535	475	1010	1554	1086	2640	3502	2548	6050	2693	1942	4635	1274	974	2248	1173	946	2119	10731	7971	18702	1788	1328	3117
All other Causes	5337	4628	9965	5852	4501	10353	6083	4842	10925	5320	4534	9854	5038	5225	11263	6369	5434	11803	34999	29164	64163	5833	4860	10693

No. 2.

Castes.	1848			1849			1850			1851			1852			1853			Total.			Average.		
	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Tota	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total
Boodhist—Jain, &c. ..										497	372	869	464	364	869	390	302	692						
Brahmun	580	449	1029	606	473	1079	853	551	1404	214	107	321	199	107	306	234	140	374	4185	2983	7168	697	497	1194
Lingaet										21	14	35	15	14	29	112	90	202						
Hindoo of other Caste ..	3143	2729	5872	4116	3276	7392	5395	4298	9693	4057	3471	7528	3709	3392	7101	3815	3286	7101	25515	21562	47077	4252	3593	7846
Hindoo Out-caste										435	365	800	417	352	769	428	393	821						
Moosulman	1306	1292	2598	1604	1163	2767	2004	1636	3640	1694	1478	3172	1526	1332	2858	1577	1452	3029	9711	8353	18064	1618	1392	3010
Parsee	381	347	728	392	361	755	500	513	1013	440	322	762	414	332	746	394	406	800	2521	2281	4802	420	380	800
Jew	72	71	143	302	177	479	480	286	766	38	29	67	22	16	38	20	30	50	1784	1230	3014	297	205	502
Native-Christian										319	219	538	304	211	515	227	191	418						
Indo-European	221	150	371	67	46	113	23	14	37	45	23	68	16	16	32	31	22	53	403	271	674	67	45	112
European	160	63	223	240	69	309	201	55	256	154	53	217	144	37	181	171	34	205	1070	311	1381	178	51	230
Negro-African	..	..	..	67	20	87	109	35	144	94	21	115	75	21	96	85	29	114	430	126	556	71	21	92
Other and Unknown Caste ..	9	2	11	12	2	14	20	2	22	5	2	7	7	5	12	8	5	13	61	18	79	10	3	13
All Castes	5872	5703	10975	7406	5587	12993	9585	7390	16975	8013	6476	14489	7312	6199	13511	7542	6380	13922	45680	37135	82815	7613	6189	13802
Asarcophagous Castes ..	580	449	1029	606	473	1079	853	551	1404	732	493	1225	678	485	1163	736	532	1268	4185	2983	7168	697	497	1194
Sarcophagous Castes ..	5292	4654	9946	6800	5114	11914	8732	6739	15571	7281	5983	13264	6634	5714	12348	6806	5848	12654	41495	34152	75647	6915	5692	12607

No. 3 (A).

Ages.	1848			1849			1850			Total.			Average.		
	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total
Days.. 0 to 15				326	246	572	622	458	1080						
,, 16 to 30	748	661	1409	41	17	58	31	22	53	2661	2157	4818	887	719	1606
Months 1 to 6				423	339	762	470	414	884						
,, 7 to 23..	898	904	1802	634	595	1229	824	820	1644	2356	2319	4675	785	773	1558
Years.. 2 to 6..	618	704	1322	734	744	1478	1045	1122	2167	2397	2570	4967	799	856	1655
,, 7 to 13..	210	223	433	375	354	729	545	511	1056	1130	1088	2218	376	362	739
,, 14 to 20..	356	417	773	557	546	1103	815	743	1558	1728	1706	3434	576	568	1144
,, 21 to 30..	975	733	1708	1627	985	2612	2011	1123	3134	4613	2841	7454	1537	947	2484
,, 31 to 40..	764	429	1193	1150	584	1734	1403	714	2117	3317	1727	5044	1105	575	1681
,, 41 to 50..	509	292	801	611	355	966	752	475	1227	1872	1122	2994	624	374	998
,, 51 to 60..	385	312	697	173	102	275	241	144	385	799	558	1357	266	186	452
,, 61 to 70..	205	161	366	563	476	1039	624	598	1222	1392	1235	2627	464	411	875
,, 71 to 80..	142	198	340	164	191	355	159	174	333	465	563	1028	155	186	342
,, Over 80..	62	69	131	28	53	81	43	72	115	133	194	327	44	64	109
All Ages	5872	5103	10975	7406	5587	12993	9585	7390	16975	22863	78080	40943	7621	6026	13647

No. 3 (B).

Ages.	1851			1852			1853			Total.			Average.		
	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total
Days.. 0 to 15..	576	472	1048	653	555	1208	705	581	1286	1934	1608	3542	644	536	1180
,, 16 to 30..	40	33	73	46	35	81	42	47	89	128	115	243	42	38	81
Months 1 to 6..	414	383	797	487	426	913	462	465	927	1363	1274	2637	454	424	879
,, 7 to 23..	684	681	1365	848	819	1667	796	819	1615	2328	2319	4647	776	773	1549
Years.. 2 to 6..	853	914	1767	850	957	1807	816	916	1732	2519	2787	5306	839	929	1768
,, 7 to 13..	376	396	772	294	316	610	307	315	622	977	1027	2004	325	342	668
,, 14 to 24..	857	787	1644	681	657	1338	686	712	1398	2224	2156	4380	741	718	1460
,, 25 to 34..	1558	883	2441	1510	679	2189	1283	759	2042	4351	2321	6672	1450	773	2224
,, 35 to 44..	1031	580	1611	815	492	1307	871	502	1373	2717	1574	4291	905	524	1430
,, 45 to 54..	671	420	1091	549	412	961	598	394	992	1818	1226	3044	606	408	1014
,, 55 to 64..	492	447	939	453	366	819	519	392	911	1464	1205	2669	488	401	889
,, 65 to 74..	257	228	485	210	233	443	213	172	385	680	633	1313	226	211	436
,, 75 & over.	204	252	456	216	252	468	244	306	550	664	810	1474	221	270	491
All Ages	8013	6476	14489	7312	6199	13511	7542	6380	13922	22867	19055	41922	7622	6351	13974

AN ACCOUNT

OF A

TUMOUR AFFECTING THE FOOT.

BY G. R. BALLINGALL, M.D., Assistant Surgeon,

Officiating Professor of Surgery in the Grant Medical College.

Presented February 1855.

The object of the following paper is to describe a peculiar kind of tumour affecting the cancellated bones of the foot, several cases of which have come under my observation in the Jamsetjee Jejeebhoy Hospital. The disease is probably known to many Members of the Society, and its external characters have, I believe, been previously described ; but so far as I am aware there is no published account of its microscopic structure, which presents appearances of a very remarkable nature.

In two cases occurring within the last three years, amputation of the leg has been performed for this disease, and several others have been seen, apparently of a similar nature, in an earlier stage, not necessitating removal. In the College museum there are two specimens, and so perfectly alike are the external characters of all of them that one description will suffice.

At first sight it somewhat resembles *elephantiasis*, the foot being uniformly and generally enlarged to about three or four times its natural size, but in no instance has the affection extended beyond the ankle, the leg remaining natural in appearance, though atrophied from disuse. The toes, also, seem less involved than the other parts of the foot. On the integument are seen a number of elevated tubercles, resembling the granulations seen at the orifices of sinuses, and in some of them there are openings,

from which thin serous pus exudes, with occasionally a pulpy granular substance, of the same nature as that which I shall afterwards describe as being found in the interior. From these openings sinuses extend inwards, a probe passing readily through them to a considerable extent towards the centre of the foot.

On making a section of the part, the bony structure is found almost entirely removed, a few osseous spiculæ only remaining here and there, so that the whole may be cut with a dissecting knife; the articular cartilages and synovial structures being also destroyed, with the exception of those of the astragalus and toes. The situation of the bones of the tarsus and metatarsus is occupied by a strong areolar texture, with spaces varying in size from that of a pin's head to a pea, filled with the pulpy granular matter mentioned as escaping from the openings in the foot. It is into this areolar texture that the probe passes, on being introduced along the sinuses. The integuments are considerably thickened, the skin and subcutaneous cellular tissue being hypertrophied, as in *elephantiasis*.

The soft parts of the leg above the tumour are atrophied, but normal in structure: in both cases in which amputation has been performed the medullary canal of the tibia has been much enlarged, the bone being reduced almost to a shell.

On a microscopic examination, the pulpy substance previously mentioned is found to consist of a mass of large cells filled with granular matter. The cells are of large size, and in some of them the cell wall seems to consist of several layers; in shape they are irregular, but most commonly circular or oval. Surrounding the cell wall are transparent fringes, consisting of long irregular spiculæ, numbers of which are seen in the field of the microscope, some quite detached, and others collected in tufts like small brushes. Numerous oil globules, probably resulting from fatty degeneration, are also visible. In the bones of the toes, the astragalus, and in the cancellated texture of the lower end of the tibia, structures, apparently of the same nature, but in an earlier stage of development, are seen. These consist of radiating groups of spiculæ, without any distinct cell in the centre. On careful examination of the medulla and bony

structure of the shaft of the tibia, no abnormal appearances are detected. On the addition of æther to these bodies, no effect is produced, but the spiculæ are removed entirely by boiling in liquor potassæ, leaving the cells unchanged.

What the nature of these bodies is it is difficult to say; the fact of æther producing no change in them proves that they are not fatty, though they resemble some of the crystallized principles of that substance. There can, I think, be little doubt that they are organized structures. Further than this I am not sufficient histologist to say, but I believe that even Mr. Queckett, to whom they were shown in London by Dr. Watson, was unable to decide upon their exact nature. The disease seems essentially of a parasitic nature, the new growth gradually taking the place of the normal bony structure, which is probably removed by absorption. It is important to observe that the cancellated bones of the foot are the only parts involved, and that no trace of disease can be detected in the medulla and shaft of the tibia.

Of the clinical history of the disease I have little to state. So far as I have yet seen, it seems confined to Guzerat, as this patient, and I think also the previous one, as well as a man whose foot was removed by Dr. Morehead for the same affection, were from that part of the country, and I have never seen a case in an inhabitant of Bombay. The patient states that there are several other cases in his own village, and promises to persuade them to come to Bombay for relief. The enlargement is very gradual, and unattended with much pain, and the chief inconvenience seems to be from the size and weight of the limb rendering it useless for locomotion.

The only remedy when the disease has attained the bulk of the tumours described is of course amputation; but perhaps if seen in the early stage, it might be sufficient to remove the affected bones, by some of the modern conservative operations, as the soft parts seem uninvolved, with the exception of some hypertrophy, arising probably from local irritation.

Of the progress of the cases after amputation I have little to say: in the former instance the stump healed well, and the present patient is also progressing satisfactorily.

The external appearance of the bones at the seat of section, their enlarged medullary canal, and thinned walls, would lead us to apprehend a return of the disease, but the result of minute microscopic examination, which failed to detect any morbid elements above the cancellated extremity of the tibia, encourages the hope that it is thoroughly eradicated. This is further borne out by the fact that none of the patients operated on have again presented themselves with recurrence of the affection in the stump.

The peculiarity of this disease has induced me to lay these short and imperfect notes before the Society; I trust, however, to be able to obtain further information respecting it.

1.—*Section of the foot showing the areolar tissue occupying the place of the tarsal bones (See Description of Disease p. 273, by Dr. Ballingall).*
2.—*Fringed cells seen under the microscope with detached fringes and oil-globules.*
3.—*The same cells in an earlier stage found in the Tibia, Astragalus and Toes.*

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APPENDIX.

APPENDIX.

No. 1.

Surgical Cases in the Jamsetjee Jejeebhoy Hospital. By G. R. Ballingall, M. D., Assistant Surgeon, Jamsetjee Jejeebhoy Hospital.

Presented November 1854.

Case 1.—Stone in the Bladder.

J. B. S., a native of Goa, was admitted into the Jamsetjee Jejeebhoy Hospital on the 27th of August 1854. He was emaciated and exhausted, and seemed to suffer much from irritability and pain about the bladder ; there were a number of fistulæ in the perineum, from which there was constant dribbling of urine, a very small quantity passing by the urethra. On introducing a sound, a stricture was found about the bulb, only admitting a bougie about the size of No. 4, and on passing it as far as the prostate a stone was distinctly felt. It was firmly fixed, and prevented the sound from fully entering the bladder. The urine was turbid, from the presence of pus, and a pretty copious deposit of albumen was produced by the usual tests.

He stated, that about ten years ago he began to suffer from stricture of the urethra, with occasional attacks of retention of urine, but no fistulæ were formed till five years afterwards, when he was salivated for the cure of his disease. Shortly afterwards a succession of abscesses formed in the perineum, on the opening of which by incisions the urine passed through the wounds, and has continued to do so ever since.

Although the case seemed an unfavourable one for operation, yet he suffered so much from the irritability of the bladder, and was so urgent for the removal of the stone, that it was resolved to attempt its extraction. On the 27th of August chloroform was administered, and a staff of about the size of No. 7 (the urethra not admitting a larger one) was introduced, and for the first time it fairly entered the bladder. Having been placed in the usual position, an incision was made on the left side of the perineum, which was found to be much thickened, and

indurated, having almost the density of cartilage. In consequence of this, and of the very small size of the staff, considerable difficulty was experienced in finding the groove, and it was only by taking the handle in the right hand, and moving it from side to side, that its situation was ascertained. The internal incision having been made, the finger was introduced, and the stone was found to be of considerable size, occupying the cavity of the bladder, which was closely contracted round it, and apparently extending forwards into the prostatic portion of the urethra. The forceps having been applied to the stone, attempts were made to extract it, but the density of the external parts, and the firmness with which it was grasped by the bladder, prevented it from moving in the slightest degree. Fortunately, the outer portion was soft and friable, and by repeated introductions of the forceps it was broken up, and removed in pieces, in doing which a good deal of force was necessarily employed. A quantity of debris was then washed out by injections of warm water, and a tube having been introduced he was put to bed; an opiate being administered after the effects of the chloroform had passed off. There was pretty free bleeding during the operation, but no large vessel was wounded. During the first incisions it was suspected that the rectum was slightly injured.

After the operation he suffered for a long time from irregular accessions of fever of a remittent character; small fragments of stone continued to pass by the wound, through which the whole of the urine dribbled. The after-treatment consisted in the administration of quinine, and occasional laxatives, with the frequent use of the hip-bath.

On the 10th of October a few drops of urine were passed for the first time through the urethra, but the greater part of it continued to dribble through the incision, which had contracted considerably. Except the relief of the pain, no improvement had taken place; he had not gained flesh, and had been latterly suffering from diarrhœa, with thin fœculent stools. This did not yield to treatment, and as it was thought that nothing more could be done he was discharged, at his own request, on the 20th of October.

1*st December*.—He unexpectedly made his appearance a few days ago, considerably improved in health and strength, and having gained a good deal of flesh. The external wound has closed, and no urine now passes through the fistulæ; he is also able to retain it for some time. He states, however, that a portion escapes during micturition through the anus, and on examination there is found to be a small fistulous opening just within the sphincter, and close to the seat of the incision. The stricture of the urethra continues in the same state; attempts to dilate it during his former stay in hospital having been given up in consequence of the use of the catheter being followed by febrile attacks. The urine contains a slight deposit of mucus, but the albumen has disappeared.

Remarks.—The only thing remarkable in this case is the recovery of the patient under such unfavourable circumstances. On his admission his impaired state of health, and the copious deposit of albumen in the urine, gave rise to the opinion that there was organic disease of the kidneys. The operation was accordingly performed only at the patient's urgent request, with the hope also that the presence of albumen might be due to the pus in the urine, a hope which its total

absence now confirms. The operation itself was an extremely tedious and protracted one, owing to the state of the perineum, the small size of the staff which it was necessary to use, and the size of the calculus; and indeed had chloroform not been given, the shock to the patient would have been very great, perhaps fatal, in his debilitated condition. The stone, or rather the portions of it which could be collected, weighed about three ounces, but a large quantity of debris was washed away, and from the greater part of it being phosphatic, its size was much greater than a lithic acid calculus of the same weight. It contained a central nucleus, about the size of a filbert, composed of uric acid.

Case 2.—Tumour of the Neck.

C. B., a Portuguese, a man of spare habit of body, was admitted on the 31st August 1854 with a large tumour occupying the left side of the neck; it was about the size of a cocoanut, irregular and nodulated on the surface, the general outline being oval, and it was of almost cartilagious density. Its longest diameter extended from just below the lobe of the left ear to the mesial line of the neck, about the level of the larynx, but on causing the patient to perform the act of deglutition, the tumour was seen to be quite unconnected with the thyroid body. The skin over it was quite sound, and moveable, and at one or two points superficial cysts were felt.

The tumour was first observed twenty-five years ago, the first thing that attracted his attention being a small swelling in the situation of the submaxillary gland; and until six months ago its increase was very gradual, and unattended by pain. Latterly, however, he was induced to apply *marking-nut* over it, which was followed by a rapid augmentation of its bulk. It does not interfere with respiration, but there is occasionally slight difficulty of swallowing; otherwise it only inconveniences him by its size and weight. As the tumour seemed to be a simple fibrous one, and quite unattached to the deeper parts,—the sternomastoid passing under it,—an operation was undertaken for its removal.

On September 2nd, chloroform having been administered, an elliptical incision was made over the long diameter of the tumour, and the lower flap dissected downwards. The adhesions were found very loose, and its removal was effected by a few strokes of the scalpel. Two arteries required ligature, and when the bleeding had completely ceased, the edges of the wound were brought together by sutures, and a piece of moistened sponge applied. About ten ounces of blood were lost during the operation.

The tumour on after examination was found to present no appearance of fibres on section; it was white, and looked very much like a cut potato, and in various parts small cysts were found containing a reddish turbid serum. Its microscopic stricture seemed to be of that kind which is called "*fibro-plastic*," or as termed by Mr. Paget "*myeloid*." It weighed twenty-three ounces.

Nothing particular occurred during the patient's stay in hospital; the greater part of the wound healed by adhesion; the detached flaps uniting to the deeper parts, and cicatrization was complete twenty-five days after the operation. Very little deformity was left, as the cicatrix was exactly parallel to and below the body of the lower jaw.

I have brought forward this case chiefly for the purpose of calling the attention of the Society to a mode of dressing, which I consider especially adapted to the treatment of the wounds made in the removal of superficial tumours, namely, the application of a large sponge over them. It was long ago recommended, and is frequently used by Mr. Syme, but so far as I have seen it is not so generally known as it deserves. Mr. Paget, when writing of the treatment of wounds, makes some remarks so apposite that I shall quote them here. He says—"There is a class of cases to which this mode of healing is peculiarly applicable, and in which more than this (simple replacement of the skin) may be required: I refer to the removal of large subcutaneous tumours, fatty tumours, and the like, where after the operation large cavities are left, and commonly left to granulate. In these cases I believe that modern surgery does not often enough employ the older method of carefully and softly padding the parts, and of so bandaging them that the exposed surfaces may be held in contact for the one, two, or three days necessary for immediate union. Many surgeons, I know, commonly employ these means, but by many they are avoided, through fear of exciting inflammation by overheating the parts, or hindering the discharge of secreted fluids." According to these views of Mr. Paget, there seem to be two indications to be fulfilled—1st, to keep the flaps in accurate contact with the deeper parts, thereby preventing the accumulation of blood or serum in the cavity; and 2ndly, to favour the escape of the serous fluid which always oozes from recent wounds. A piece of sponge, by its elasticity and absorbent properties, seems especially fitted to fulfil both indications. It may be considered superfluous at the present day to say anything on the treatment of incised wounds, about which so much has been already written, but this is a point which is not sufficiently attended to by our surgical writers, though, I am convinced, on a proper attention to it, the success of such operations as the one I have described depends. In the present case, had the lower flap not united in this way, a large cavity filled with pus would have been left, probably rendering a counter opening necessary, and at all events requiring a long time for its healing by granulation.

Case 3.—Ligature of the Left Common Carotid Artery.

C. K., a Mussulman, aged 30, was admitted on 16th August 1854, with a tumour about the size of a large mango, extending from a little below the thyroid cartilage to the left ear, and following the course of the external carotid artery of that side. The tumour was hard and unyielding, and scarcely any diminution was noticed on compressing either it or the artery below, but there was most distinct expansive pulsation synchronous with the pulse, and a pretty loud bruit was audible.

The tumour does not cause pain, but there is hoarseness of voice, and some difficulty of respiration and deglutition, with slight impairment of sight and hearing on the left side. He suffers occasionally from pain of the left side of the head, and is subject to chronic rheumatic attacks.

The previous history was not very clear. He had suffered from syphilis, and been salivated. About two years ago the left side of the head became painful. The tumour was first observed about eighteen months ago, when it was very small,

and situated about the bifurcation of the left common carotid. Eight months ago it attained its present size, when actual cautery was applied to the skin over it. Since then no increase in its bulk has taken place, but the pain of the left side of the head has of late been much aggravated. He had presented himself at the hospital some time before, when the tumour was much in the same state, but as it was beginning to interfere with respiration, ligature of the carotid was proposed, but he refused to submit to the operation. On having the nature of the disease again explained to him, he consented.

17*th August.*—An attempt was made to bring him under the influence of chloroform, but it caused such extreme embarrassment of respiration that it was given up. When recovering from its effects, vomiting came on, on the cessation of which the operation was commenced, the man being perfectly sensible. An incision between two and three inches long was made along the inner border of the left sternomastoid muscle, and a second extending from its lower end nearly opposite the sternoclavicular articulation for about an inch and a half outwards, parallel to the clavicle. This last was made with the intention of dividing the sternal portion of the muscle,—a proceeding which was, however, not found necessary. No difficulty was experienced in exposing the artery, as no vein of any size was seen. The coats of the vessel seemed sound, and a ligature was applied in the usual way, about half an inch above the clavicle ; immediately after which all pulsation in the tumour ceased. About two ounces of blood were lost.

The operation was not followed by distinct cerebral symptoms, the sight and hearing of that side became more perfect, and the only complaint made was of a little pain and numbness of the left arm and leg. On the 31st August, about thirteen and a half days after the operation, the ligature was found quite detached, and lying loose on the surface of the wound ; not a drop of blood was lost at this time.

On 15th September symptoms of suppuration appeared; great pain was complained of, and the tumour rapidly increased in bulk ; the skin over it was hot, and indistinct fluctuation was felt on its outer side. On the 17th, fluctuation being more distinct, and deglutition considerably impeded, the tumour was punctured with a trocar, when some fœtid grumous pus escaped. An incision about an inch and a half long was then made, and about three ounces of similar fluid escaped. On the 21st the swelling was diminished in size, but it was necessary to enlarge the incision. From this time up to the 27th the tumour gradually subsided, and several pieces of coagulated lymph like those seen in aneurismal sacs were removed. On the evening of the 26th, in the act of sneezing, he felt something give way; profuse arterial hæmorrhage came on, and before it could be arrested by compression, about a pint of blood was lost. The bleeding again occurred on the evening of the 27th, but was checked by the careful application of a graduated compress.

In the further progress of the case there is nothing of importance ; there has been no return of the hæmorrhage, the cavity has been obliterated, and the only remaining mark of the tumour is a depressed cicatrix at the seat of incision. A small portion of the original wound, however, remains unhealed, and there is a sinus extending directly backwards, which has resisted all treatment.

The edge of the sternomastoid has been divided, under the impression that its contraction interfered with the closure of the sinus; this also has failed, and it may perhaps be necessary to resort to more complete division of the muscle.

This case is interesting, as affording an example of a disease rarely met with among the natives of India; at least it is the first case in which any artery has been ligatured for aneurism in the Jamsetjee Jejeebhoy Hospital. It is difficult to understand why it should be so seldom met with, as the structural change in the coats of arteries which so frequently leads to aneurism is by no means uncommon, at least in the aorta, and the museum of the Grant College contains a number of aneurisms of this vessel. I suspect, however, that atheromatous degeneration of the arteries of the extremities is much less frequent in India than in Europe; at least I have never met with any instances in the dissecting room,—a statement, however, not of much value, as I have not examined the arteries with the view of determining this point. Natives, again, though often following pretty laborious occupation, are not in the habit of making the sudden and violent efforts which are generally the immediate exciting causes of aneurism, and it is worthy of remark that this man is a sailor, a class of men particularly predisposed by their profession, and as shown by statistics particularly liable to suffer from this disease.

In the progress of the case there is little requiring comment. Fortunately, the artery involved was the *left* carotid, the tumour coming so low down in the neck as to render it necessary to tie the vessel close above the clavicle, an operation which would have been extremely dangerous on the right side, the vicinity of the subclavian interfering with the adhesion of the arterial walls, on which depends the safety of the ligature. Suppuration of the sac is common in carotid aneurisms, especially in those of a large size, and is more likely to happen in hospital than in private practise, from the more frequent handling which such patients undergo. Its occurrence is chiefly dangerous from the liability to hæmorrhage from the sac, which in this case was so profuse as to render it certain that the blood flowed from a large vessel. My own impression is that it proceeded from the upper portion of the internal carotid. Hæmorrhage of this kind causes a great deal of anxiety, from the difficulty of treating it, for it would be a hopeless attempt to ligature the bleeding point by enlarging the wound; and even were the artery found, its coats would be probably so softened by the previous inflammation, that the ligature would not hold. Had pressure failed, I fear the only resource would have been to apply the actual cautery—a proceeding not very efficacious in an artery of this size. In one sense the suppuration may be said to be fortunate, as otherwise the tumour would not have been removed, and the patient would not, I suspect, have considered himself cured.

P. S. 25*th January* 1855.—Since the above was written the sinus healed, and he was discharged apparently well. A few days ago, however, he returned with symptoms of phthisis pulmonalis, the physical signs indicating the presence of a cavity under the left clavicle.

No. 2.

On the Average Quantity and Density of Urine, as observed in Natives of India; being extracts from a Paper read before the Grant College Medical Society. By Mr. S. A. De Carvalho, Graduate of the College.

Presented July 1854.

In the months of July, August, October, and November 1852, and in February and March 1853, Mr. Carvalho conducted some inquiries into the normal quantity and specific gravity of urine, as passed by Natives of this country, in a state of health. The results are stated in the following Tables. The parties whose urine was examined twice a day, with great care and regularity, were healthy ward-boys, four to six in number, of the Jamsetjee Jejeebhoy Hospital, of between 20 and 30 years of age, of active and temperate habits, and Mahrattas by birth.

Mr. Carvalho says:—"The observations being limited to a few individuals, all of the same caste and country, and following the same occupations, the results must be taken with some caution, although the following general statement may be made:—

"Upon comparing the Tables with observations made in European countries, it will be seen that the average quantity of urine passed by Natives of India is greatly in excess, notwithstanding the high temperature to which individuals are here subjected, and the consequent freer cutaneous excretion and exhalation. It will also be seen that, relatively to the quantity, the average specific gravity is also less; for example, Dr. Prout* assigns 1020 as the average specific gravity of urine in Europe, whilst here it ranges from 1007 to 1016." "As regards the color and reaction of the urine, it would appear to be more frequently of a pale amber or clear lemon color, than of a decided clear amber. Turbidity has generally been due to decomposition, which also has the effect of changing its reaction from acid (as it is generally when examined fresh) to alkaline. In general, almost a constant relation is found to exist between the turbidity and alkaline reaction of the urine, not difficult of explanation. The small quantity of mucus present in healthy urine undergoes decomposition,† and acting as a ferment converts the urea into carbonate of ammonia, just as yeast aids the conversion of sugar into alcohol. Hence the alkaline reaction to test paper, which upon exposure to air is lost by the evaporation of the ammonia. This salt, uniting with the acids of the urine, precipitates the earthy phosphates with some carbonates of lime, and hence the turbidity."

"As to a sediment often seen of a white, thick, and creamy appearance, it has been found to consist of crystals of the triple phosphate, united with more or less of

* Urinary Deposits, by Dr. Golding Bird, p. 34, 2nd Edition.

† Ditto ditto ditto pp. 66 and 223.

a fine granular amorphous substance (urate of ammonia?). But sometimes instead of the triple phosphate, abundant fine crystals of uric acid are seen, and occasionally both varieties intermixed."

"When the urine is acid and clear, neither heat nor nitric acid affect it; but when alkaline and turbid, it becomes more turbid, and effervesces by heat being applied; nitric acid also causes effervescence, but diminishes or removes the turbidity. Boiling clear urine is sometimes sufficient to cause a turbidity, by converting a portion of the urea into carbonate of ammonia."

In a subsequent note Mr. Carvalho explains that although the low specific gravity of 1007 to 1016 is not clearly shown in the Tables, yet from more frequent inquiries he is quite satisfied of the accuracy of that being the average density of urine passed by Natives in the country, and that during a state of disease of the kidneys (as in Bright's Disease) the specific gravity is also proportionally lowered. On this point further data are much required.—(Vide Medical and Physical Society's Transactions, Vol. X. page 235.)

From the accompanying Tables the following abstract of results has been drawn up:—

	Specific Gravity of Urine.			Quantity of Urine.		
	Night.	Day.	Night and Day jointly	Night.	Day.	Night and Day jointly
				oz.	oz.	oz.
Rainy months of July and August	1015·53	1017·70	1016·43	25·16	17·84	43·00
Dry months of October, November, February, and March	1017·75	1018·81	1018·18	23 92	17·87	41·79
General average	1016·64	1018·26	1017·31	24·54	17·86	42·40

N. B.—The specific gravity of the urine in the Tables is corrected for temperature.

Tables showing the different Monthly Observations upon Urine.

	July.	August.	October.	November.	February.	March.
Temperature at time of observation....Morning, 7. A. M.	80° to 83°	79° to 83°	77° to 84°	79° to 83°	71° to 77°	74° to 80°
Do. do. ....Evening, 4. P. M.	79° to 87°	79° to 87°	86° to 91°	86° to 90°	78° to 86°	81° to 89°
Average fall of Rain	Inches 49·77	Inches 24·78	None.	None.	None.	None.
BALLOO, *aged* 30 *years.*						
Number of observations.....	30	59	35	37	49	58
Night Urine.						
Average quantity.....	Oz. 38·1.	Oz. 42.	Oz. 22.	Oz. 32.	Oz. 33.	Oz. 29.
,, specific gravity.....	1010·1.	1010·7.	1013.	1018·1.	1014·4.	1012·3.
Appearance	Pale lemon, more or less turbid.	Pale amber, generally turbid.	Pale lemon, turbid & with sediment.	Pale lemon, turbid.	Lemon, clear or turbid.	Pale lemon, clear or turbid.
Reaction	Neutral.	Alkaline.	Alkaline.	Alkaline.	Various.	Various.
Day Urine.						
Average quantity.....	Oz. 28·1.	Oz. 23.	Oz. 13.	Oz. 23.	Oz. 27.	Oz. 20.
,, specific gravity	1011·5.	1014.	1013.	1016·1.	1016·6.	1015.
Appearance	Pale lemon, clear or turbid.	Amber or lemon, clear or turbid.	Pale lemon, clear.	Pale amber, turbid.	Lemon, pale, clear or turbid.	Lemon or amber, clear.
Reaction.....	Neutral, sometimes alkaline.	Various.	Neutral.	Alkaline.	Various.	Various.
NARRAYEN, *aged* 21 *years.*						
Number of observations.....	61	60	34	35	46	59
Night Urine.						
Average quantity.....	Oz. 21.	Oz. 23.	Oz. 26.	Oz. 20.	Oz. 25.	Oz. 20.
,, specific gravity.....	1022.	1017.	1019·2.	1023·3.	1019·5.	1021·5.
Appearance	Amber, turbid, with sediment.	Lemon & amber, turbid.	Lemon & amber, clear or turbid.	Amber, turbid, with sediment.	Lemon or amber, clear, turbid.	Lemon or amber, clear or turbid.
Reaction	Alkaline.	Alkaline.	Neutral.	Alkaline.	Acid, neutral.	Acid or alkaline.
Day Urine.						
Average quantity.....	Oz. 18.	Oz. 16.	Oz. 16.	Oz. 17.	Oz. 25.	Oz. 17.
,, specific gravity	1020.	1016.	1020·2.	1019·	1020.	1022.
Colour	Amber, turbid with sediment.	Amber, clear and turbid.	Lemon or amber, clear or not.	Lemon or amber, turbid.	Lemon or amber, clear or turbid.	Amber, clear or turbid.
Reaction	Alkaline, occasionally neutral.	Alkaline or acid.	Neutral.	Alkaline.	Neutral.	Various.

BAJEE, *aged* 22 *years.*

	July.	August.	October.	November.	February.	March.
Number of observations	30	54	34	No observation.	29	58
Night Urine.						
Average quantity	Oz. 21·5.	Oz. 22.	Oz. 18.	,, ,,	Oz. 33.	Oz. 18.
,, specific gravity	1018.	1018.	1021.	,, ,,	1015.	1020·4.
Appearance	Amber, turbid, with sediment.	Amber, turbid, with sediment.	Amber, turbid, sediment.	,, ,,	Lemon, clear or turbid.	
Reaction	Alkaline.	Alkaline.	Alkaline or neutral.	,, ,,	Alkaline.	
Day Urine.						
Average quantity	Oz. 20·3.	Oz. 20.	Oz. 15.	,, ,,	Oz. 25.	Oz. 14.
,, specific gravity	1017·4.	1018.	1022.	,, ,,	1018·5.	1019.
Appearance	Amber, turbid or clear, with sediment.	Lemon, turbid or clear, with sediment.	Lemon, turbid, sediment.	,, ,,	Lemon, clear or turbid.	
Reaction	Alkaline or acid.	Alkaline.	Alkaline.	,, ,,	Alkaline.	

ITTOO, *aged* 25 *years.*

Number of observations	56	59	34	23	No observation.	52
Night Urine.						
Average quantity	Oz. 14.	Oz. 13.	Oz. 11.	Oz. 11.	,, ,,	Oz. 13.
,, specific gravity	1019·1.	1011·1.	1023·4.	1017.	,, ,,	1016.
Appearance	Amber, turbid, with sediment.	Lemon or amber, turbid.	Lemon, turbid.	Lemon, turbid.	,, ,,	Lemon, turbid, sediment.
Reaction	Alkaline.	Alkaline.	Alkaline.	Alkaline.	,, ,,	Alkaline or neutral.
Day Urine.						
Average quantity	Oz. 9.	Oz. 9.	Oz. 7.	Oz. 7.	,, ,,	Oz. 13.
,, specific gravity	1023.	1021.	1021·4.	1022.	,, ,,	1019.
Appearance	As of the night.	Amber, turbid or clear.	Amber, turbid.	Lemon, turbid, sediment.	,, ,,	As the night.
Reaction	Alkaline.	Variable.	Alkaline.	Alkaline.	,, ,,	,, ,,

DAJEE, *aged* 30 *years.*

	July.	August.	October.	November.	February.	March.
Number of observations	None.	59	34	39	None.	27
Night Urine.						
Average quantity	,,	Oz. 23.	Oz. 29.	Oz. 32.	,,	Oz. 32.
,, specific gravity	,,	1012·1.	1016·3.	1015·2.	,,	1014·3.
Appearance	,,	Amber, turbid, sedimentary.	Amber, turbid, sediment.	Lemon or amber, turbid.	,,	Amber, turbid, sediment.
Reaction	,,	Alkaline.	Alkaline.	Alkaline.	,,	Alkaline.
Day Urine.						
Average quantity	,,	Oz. 22.	Oz. 16.	Oz. 18.	,,	Oz. 28.
,, specific gravity	,,	1016.	1020.	1019.	,,	1017.
Appearance	,,	Amber, clear or turbid.	Lemon or amber, clear or turbid, sediment.	Pale lemon, clear or turbid, sediment.	,,	Amber, clear or turbid.
Reaction	,,	Alkaline or neutral.	Neutral, alkaline.	Alkaline.	,,	Various.

MAHADOO, *aged* 32 *years.*

Number of observations	None.	60	28	None.	21	30
Night Urine.						
Average quantity	,,	Oz. 33·4.	Oz. 21·5.	,,	Oz. 29.	Oz. 24.
,, specific gravity	,,	1017·2.	1019·5.	,,	1018·4.	1017·1.
Appearance	,,	Lemon or amber, clear or turbid.	Clear or amber, turbid, sediment.	,,	Lemon, turbid.	Lemon or amber, turbid.
Reaction	,,	Alkaline.	Alkaline.	,,	Alkaline.	Alkaline or acid.
Day Urine.						
Average quantity	,,	Oz. 13.	Oz. 13.	,,	Oz. 25·4.	Oz. 18.
,, specific gravity	,,	1020.	1021·5.	,,	1018.	1015.
Appearance	,,	Lemon or amber, turbid.	Lemon or amber, clear or turbid.	,,	Lemon or amber, turbid.	As the night.
Reaction	,,	Various.	Alkaline or neutral.	,,	Various.	Various.

No. 3.

Observations on Leprosy; being extracts from a Paper read before the Grant College Medical Society. By Mr. C. J. Lisboa, Graduate of the College.

Presented July 1854.

Whilst Mr. Lisboa was attached to the Jamsetjee Jejeebhoy Hospital his attention was particularly directed to the subject of leprosy, and he has since that time continued his observations.

After noticing the divisions usually adopted by authors, and after pointing out the distinctions between true tubercular leprosy and the various affections allied thereto, Mr. Lisboa arranges the cases which he has seen under the classes of *anæsthetic* and *tubercular* leprosy.

1*st*.—Anæsthetic Leprosy.

"On some part of the body, most commonly on the extremities, one or more transparent or translucent bullæ appear, varying in size from a large pea to a hen's egg. They make their appearance suddenly, without being preceded by pain, heat, or redness, and after a few hours burst, and give exit to a thin puriform fluid. The exposed cutis then ulcerates, and discharges a thin yellow, offensive pus. After some days the discharge lessens, and ceases altogether. The ulcers do not extend in circumference, but in depth; they are generally round or oval, with even, regular, and smooth edges, scarcely raised above the surrounding integument, and the surface is dry, red, glazed, and without granulations. In this condition the ulcers remain for a long time, and upon healing leave a circular and depressed cicatrix. The palms of the hands and the soles of the feet are chiefly and most commonly attacked; afterwards, other parts of the body. Sometimes the disease begins by the formation of two or three small superficial ulcers around the knees and elbows, and on the fingers and toes, which heal, and leave cicatrices. In this way a succession of ulcers appear and disappear. Before long anæsthesia of certain parts of the body is observed. Sometimes it even precedes the ulceration. It affects first of all the fingers and toes, then the feet, legs, and thighs, and afterwards the upper extremities. White spots of large size, devoid of sensibility, appear on the trunk; but with these exceptions the trunk, head, and neck preserve their sensibility. Although insensible to the touch, yet a deep-seated pain, or burning, is often complained of in the extremities."

Mr. Lisboa thinks the insensibility comes on very gradually, and he has not observed any instance in corroboration of the opinion of the Norwegian Physicians, that an *exalted* sensibility of the parts precedes its loss.

Besides anæsthesia, certain parts of the body are sometimes attacked with

paralysis, and those observed by Mr. Lisboa were chiefly of the fingers, which were rigidly flexed and immoveable, except with pain and difficulty.

"In advanced cases the skin becomes covered with eruptions of various kinds, as impetigo, scabies, eczema, &c., and the feet, toes, and fingers are shortened, and fall off. The eruption is generally very copious and confluent, and the vesicles breaking up, give rise to a continuous layer of incrustation, which covers large portions of the skin." Mr. Lisboa thinks the shortening, and falling off of the fingers and toes may be accounted for in one of two ways, either by ulceration and gangrene, or by a process of interstitial absorption, or caries. He inclines to the view of interstitial absorption, because the bones become *thinner*, smaller, and smoother as the disease advances. "The absorption or shortening of the bones takes place in a regular order, beginning with the distal extremity of the last phalangeal bone; it creeps up to the 2nd and 1st phalanges, and lastly to the bones of the metatarsus and tarsus; in other words, commencing with those parts most distant from the heart."

"A patient affected with this disease becomes greatly debilitated and exhausted, and the functions of the vascular and nervous system are rapidly impaired. Death occurs either from exhaustion, or is due to some intercurrent affection, as diarrhœa or dysentery."

The only morbid appearances found by Mr. Lisboa in the few cases in which a *post-mortem* examination was made consisted of some paleness of the grey matter of the spinal cord, and the appearances of the bones of the extremities before mentioned. The prognosis is always unfavourable.

The following cases are recorded :—

Case No. 1.

V. de C., a Christian sailor, aged 44, native of Mahim, and for the last twelve months an inmate of the Dhurumsalla, was admitted into the Jamsetjee Jejeebhoy Hospital on the 18th July 1851. There are two circular ulcers on the sole of the left foot, and one on that of the right, each of about the size of half a rupee. Their margins are even and smooth, and the surface is deep, (reaching almost to the bones,) of a red colour, and devoid of granulation. Discharge almost none. Besides these there are several other small irregular ulcers, and also cicatrices of old ulceration on the left leg. Some fingers of both hands are destroyed up to the 1st phalanx by sphacelation. Two or three fingers are shortened apparently by the partial removal of the 2nd and 3rd phalanges, the latter still bearing the nail. All the joints are closely approximated to each other. There are numerous superficial cicatrices on both fore-arms and legs, and still more numerous around the knee and elbow-joints. The sensibility of the fore-arms, hands, legs, and feet is blunted, but that of the rest of the body is not affected. No constitutional disturbance; organs of the chest and abdomen present nothing abnormal.

The disease commenced by the successive formation of bullæ, resembling very much those caused by Guinea-worm, for several months, over different parts of the feet, legs, hands, and fore-arms, and 1st of all around the knees and elbows. Now and then spiculæ of bone have been discharged through the openings left by the formation and bursting of small abscesses in several fingers. Does not admit that any member of his family ever suffered from a similar complaint. Whilst he was in the hospital all the ulcers above described cicatrized, and others were formed; the right 4th toe sloughed away, and the conjunctiva of the left eye inflamed, and in spite of the usual treatment the cornea was destroyed within four days by chemosis. The glands in the left groin were also swollen, and painful. He died on the 15th of November from an attack of pneumonia of the left lung.

Post-mortem examination 16 *hours after death.* *Cranium.*—All the contents of the cranium healthy.

Spinal cord healthy. With regard to its consistency, and the color of the cortical portion, the grey matter was barely visible in the cervical and dorsal portions, and pale in the lumbar.

Chest.—Both lungs adhered to the parieties of the chest by old adhesions.

Right lung healthy, but imbedded in its substance there were here and there small hard nodules of white colour, free from surrounding redness. On analysis, they were found to consist of carbonate of lime.

Left lung not collapsed. With the exception of the thin anterior edge, which presented several large congeries of emphysematous cells, the whole of the superior lobe and upper part of the inferior were in the 2nd stage of pneumonia. They were soft and flabby; their external surface was of a dark red colour, and the incised surface smooth, and also of a dark red colour.

At the apex of the superior lobe there was a spot about 4 inches in circumference, of dark blue colour, and softened into a pulpy substance, presenting here and there very small cavities. It emitted a very offensive gangrenous smell.

The lower half of the inferior lobe was congested, but healthy.

Abdomen.—Liver enlarged, and very flabby; external surface pale. Situated close to the superior border of the right lobe, there was a sort of abscess or rather a spot about 5 inches in circumference, in which the substance of the liver was of a dirty dark grey colour, very much softened, so as to be easily broken down into a dark pulpy matter, emitting a very offensive smell. The rest of the organ, both externally and internally, was pale, but otherwise healthy.

Kidneys.—Both were soft, flabby, and pale, but their structure was healthy.

On the anterior surface of the right one there was a point of the size of a large pin's head, in which collection of puriform matter had taken place. There was no surrounding redness. On the posterior surface of the left kidney there were two small serous cysts.

Spleen small, soft, but healthy. Intestines not examined.

Case No. 2.

J. B., aged 29, Indo-Briton, musician, born in Bombay, and resident at Deesa, was admitted into the Jamsetjee Jejeebhoy Hospital on the 23rd September 1851.

Over the dorsum of the right great toe there is a large irregular ulcer, extending from the tip backwards to its root. Its surface is red, and discharges a slight purulent matter; it is deep, and reaches at one point to the phalangeal bones, which in this situation are left bare, but appear healthy, and do not present any indication of caries or necrosis. On the sole of the right foot, a little behind the root of the great toe, there is a deep circular ulcer, with even margins, and red and almost dry surface. Besides, there are numerous small superficial cicatrices on the dorsum of this foot, and its toes, the nails of some of which are destroyed. On the plantar surface of the left foot a deep cicatrix of an old ulcer is seen. No other cicatrix is observable on this foot or its toes. Both feet and legs are covered with a papular eruption. All the fingers are rigidly flexed, the flexion being more marked at the joint between the 1st and 2nd phalanges, so that the patient is unable to extend them; they all present small superficial cicatrices. There are several white spots on the trunk, of the size of a dollar or larger, distinct in color from the surrounding skin. The sensibility of these spots and of the upper and lower extremities, as high as the shoulder and hip joints, is completely extinguished. States that the disease has existed for the last six or seven years, that it commenced by the appearance on the trunk of an eruption resembling ring-worm, which on enlarging left the present white spots; that subsequently large bullæ, or blisters, appeared suddenly, but occasionally on the fingers and both feet and toes; they burst, and left superficial ulcers, which healing left the present cicatrices seen on these parts; that the ulcers now seen on the right foot and great toe made their appearance some few months ago; they also were produced by the formation and bursting of large bullæ.

Further states that the insensibility of the hands and feet preceded the appearance of the white spots on the trunk, and that it was the first symptom which attracted his attention. Denies that his parents suffered from leprosy. Whilst he was in the hospital he frequently complained of deep-seated pain of the left leg, in which there was neither swelling nor any redness, and the skin of both the feet and legs was covered with a scaly eruption : but the ulcers having cicatrized, he was discharged at his own request on the 4th of December.

Case No. 3.

S. C., aged 20 years, a Hindoo female, native of Poona, and resident here for the last fifteen days, was admitted into the Jamsetjee Jejeebhoy Hospital on the 20th December 1851. All the fingers of the left hand are rigidly flexed towards the palm, so are also the thumb and little finger of the right hand, whilst the remaining fingers are slightly bent. Some of the toes, chiefly the great ones, are shortened, but do not present on their surface any ulceration or cicatrix. The left little toe is reduced almost to a fleshy point. On the sole of the left foot there is a deep circular ulcer, slightly moistened with a thin sanious discharge. Both the upper and lower extremities are almost entirely covered with a pustular eruption, scabbed over ; and the skin here and there is largely fissured. The trunk also presents the same kind of eruption scantily dispersed over it. The sensibility of the fore-arms and hands, legs, and feet is altogether absent. States that the disease has existed for the last five or six years ; that it commenced by the appearance over the extremities of a pustular eruption. Also states that her father died of a similar complaint in the Byculla Dhurumsalla, but that her two sisters, still living, are free from the disease.

25th December.—Left the hospital without permission.

Case No. 4.

F. B., aged 60, a Parsee, labourer, native of Bombay, was admitted into the Jamsetjee Jejeebhoy Hospital on the 25th July 1851.

Situated on the under surface of the right foot there is a nearly circular ulcer, of the size of half a rupee. It is deep, reaching almost to the bones of the tarsus. Its margins are regular, smooth, and thick, but not raised above the surrounding integuments. The surface is of a reddish colour, devoid of granulations, and discharging a puriform fœtid matter. The cuticle around is raised into a large blister, containing apparently puriform fluid. Immediately in front of this there is another one covered with a slough, and also surrounded by a large bulla of cuticle. The foot is somewhat swollen, painful, and red, chiefly towards the inner side. The little toe of the same foot has dropped off, and only a cicatrix is seen in its situation. Over the sacrum there is an oval ulcer, about $2\frac{1}{2}$ inches long and three-fourths of an inch deep. At one point it reaches the sacrum, which is laid bare. He states that the ulcer on the heel has existed for the last two months ; that it commenced by the formation and bursting of a bulla, and the smaller one in front of it was formed about two or three days ago. The one situated on the sacrum is of about two months' standing, and has been caused by the pressure of the bed. Also states that the right little toe was destroyed about three months ago by the formation and bursting of an abscess, and subsequent ulceration. Does not know whether any member of his family ever suffered from leprosy.

Whilst in the hospital the ulcer on the sacrum showed a tendency to cicatrize, and the others were not large, but he became daily more and more exhausted, and unable to move from his bed. Diarrhœa came on, and proved fatal on the 20th August.

Case No. 5.

R., aged 45, Hindoo, bhistee, native of Goozerat, was admitted into the Jamsetjee Jejeebhoy Hospital on the 28th of October 1851. On the plantar surface of the right foot there are two ulcers, one large, oblong, and dry ; the other deep, circular, and also dry. An ulcer discharging much purulent matter is just forming on the under surface of the 2nd left toe, and several small superficial irregular sores

are seen on the dorsum of both feet. The sensibility of the feet is completely destroyed; that of the legs and other parts of the body is not affected. States that the disease has existed only for the last month, and that loss of feeling in the feet preceded the eruption of ulcers by about a month. During the short stay of this patient in the hospital there appeared on both feet other ulcers, which quickly enlarged, and discharged a good deal of pus. On the 27th November he was removed by his friends in a very exhausted state.

Case No. 6.

P. G., aged 60, a Hindoo, stone cutter, was admitted into the Jamsetjee Jejeebhoy Hospital on the 27th July 1851. On the outer side of the right foot there are three circular ulcers, each nearly of the size of a rupee. Their surface is red, and discharges a sanious fœtid matter. All are deep, reaching almost to the bones, and contiguous to one another. On the inferior surface of the right heel there is a small circular ulcer, with regular margins and dry surface. On the dorsal surface of the 2nd, 3rd, and 4th toes of the same foot there is a superficial ulceration, or rather an excoriation of the skin. The sensibility of the feet is blunted. The fingers of the right hand are partially closed, but the flexion is not rigid. States that the ulcers on the outer side of the right foot were caused by the protrusion of a Guinea-worm, about a month ago. By the 18th of August the ulcers on the outer side of the right foot and that on the heel had cicatrized. On the 2nd September the inferior and upper extremities were covered with scaly eruption. On the 6th of the latter month he was discharged at his own request, and re-admitted on the 5th of October with a large ulcer on the under surface of the right foot. He became daily exhausted, and died on the 27th October.

"Note.—It will be observed that these cases present some peculiarities; the chief and most prominent is the depression of the action of the heart, and the great prostration of strength, which went on increasing daily and rapidly. The unfortunate patients could not leave their beds, the face became anxious, and assumed a peculiar expression of distress, and the pulse failed daily in strength, till death occurred. And yet the local disease was not at all sufficient to explain this train of symptoms. There were ulcers on the feet, or on some other part of the body, but they were not such as to cause death of themselves. In one or two instances the ulcers were actually dry, granulating, or progressing towards cicatrization, and yet the debility of the patient and failure of the action of the heart went on increasing rapidly. In the next place the disease generally commenced by the formation of bullæ on the fingers and toes; and, as already described, these were followed after some time by the appearance on the soles of the feet and palms of the hand of dry circular or deep ulcers, which seldom became larger than the bullæ from which they originated, except in the last stage of the disease, when the powers of the system were already depressed by its prolonged influence. But in the cases just detailed it will be seen that the characteristic ulcers were at once formed on the feet and other parts of the body, and quickly enlarged both in size and depth, discharging much purulent matter. Lastly, all these cases proved fatal between three and six months. In the generality of cases death occurs after many years."

2nd.—Tubercular Leprosy.

Mr. Lisboa says he has not seen any case of what is called by some authors *acute* tubercular leprosy, but that many patients are yearly admitted into the Jamsetjee Jejeebhoy Hospital suffering under the chronic form.

He divides the symptoms into three stages.

"*The 1st stage*," he says "usually commences by discoloration of the skin, in patches of an irregular outline, and of different sizes, varying from a pea to that of the palm of the hand.

"These patches are slightly raised above the surrounding integument, and are of a peculiar deep brown or bronzed color, presenting a shining surface, as if oiled. They are more or less painful at the commencement, but subsequently regain their natural sensibility; and after the lapse of months they become (though not always) insensible.

"At the outset of the disease the patches are small, indistinct, and few; but in course of time their number increases, by the appearance of fresh ones, which take place very slowly, and as it were in successive crops, each being preceded in some cases by febrile symptoms, more or less intense. Then the affected portions of the skin become tumid, discolored, and shining, and sometimes *over*-sensitive. But when the fever has subsided, which takes place within one or two days after the eruption of the blotches, the tumidity lessens, the discoloration becomes rather less deep, and the pain disappears. In some cases on subsidence of febrile heat the eruption also disappears altogether, to reappear after some time, with or without the same train of symptoms. The disease first attacks the ears, cheeks, and nose, then the upper and lower extremities, (and of these the hands and feet are the parts first affected,) and lastly the trunk. In some cases the discolored spots, generally more or less large, appear simultaneously over several parts of the body, as ears, cheeks, hands, and feet; in others, they are limited to the face for a long time. When the blotches are few, they do not cause much anxiety in the mind of the patient, and are often passed unnoticed, or if noticed, they are attributed to syphilitic virus, or to some other cause.

"*The 2nd stage, or Eruption of Tubercles.*—After the blotches are formed as above described, they generally remain stationary for months, or even years, but they become more distinct from the color having gradually been deepened, and then minute tubercles present themselves over their surface, and over the sound skin. These are of a brown or bronzed color, (not differing from the discolored skin over which they are seated,) soft and round, and not insensible at first. The order of their appearance is the same as that of discolored spots; that is, they are to be seen first on the ears and cheeks, and last of all on the trunk, and in the latter situation they do not appear but after a long time, generally some months or even years after the commencement of this stage, and then, too, very thinly scattered here and there. Some of the tubercles situated over the legs, perhaps occasionally those on the hands, assume a very large size. The tubercles on the face are very numerous, and seldom enlarge; perhaps those on the cheeks may occasionally do so. Hence of all the parts of the body the face appears to be, and is in fact, horribly deformed. The face, cheeks, alæ, and tip of the nose, as well as the forehead, are swollen, and considerably enlarged; the columna nasi no longer being able to support the enlarged tip, the latter becomes depressed, and gives to the whole of the features an ugly, hideous, and deformed appearance. The concha of the ear, and chiefly its lobe, becomes also much increased in size. The deformity is further increased by the complete falling off of the hairs of the eyebrows, palpebræ, and beard. Those on the head and pubes become also by degrees scarce, and may

perhaps completely disappear. By this time the tubercles enlarge, become more numerous, and spread almost all over the body, being of course more copious in some parts than others. Small tubercles, thinly scattered, now appear also over the mucous membrane, covering the root of the tongue, uvula, and pharynx, and they are said to be seen also over that lining the stomach and intestines. The disease attains this degree after a long time ; and the tubercles, like the blotches, generally appear in successive crops, sometimes being preceded like them by febrile symptoms, but during the interval of the eruption of these crops the patients continue free from fever.

"*The 3rd stage of ulceration and sphacelation.*—After the tubercles have increased in size, they gradually become insensible, inflame, and suppurate, or sphacelate, and on the separation of the sloughs, ulcers more or less large are left. Several ulcers thus formed, of dirty red surface, irregular outline, and discharging sanious purulent matter, generally copious, may be seen here and there over the legs, feet, fore-arms, and hands, and over the pharynx and uvula, but very seldom over the face. The uvula becomes destroyed, and thence the ulcerative action extends upwards to the mucous membrane lining the nasal cavity, which already being almost closed anteriorly by the falling down of the tip, and enlargement of the alæ of the nose, now becomes choked by purulent secretion. Sometimes the mucous lining of the nasal cavity is attacked with ulceration before the uvula and pharynx ; and the turbinate bones and cartilages of the nose become carious, and the voice nasal and hoarse. At last also the cartilages of the larynx become affected with ulceration, and the voice almost extinct. Simultaneously with the symptoms above detailed, or some time before the disease has progressed to that extent, the fingers and toes are destroyed by ulceration or sphacelation. The process of destruction is of course slow, being the work of years. It follows a course similar to that of the anæsthetic leprosy, viz., the last phalanges drop off first, and the ulcers left heal slowly ; after the lapse of some months the second, and lastly the first phalanges follow the same course, that is, they also become mortified, and drop off, leaving the hands and feet without fingers and toes, so as to render the upper and lower extremities useless ; and these may in their turn be struck with mortification. Of course the mortification does not occur in all the toes or fingers to the same extent and degree ; for while some are completely destroyed, others remain intact. The process generally commences first on the toes, and after a time on the fingers, though the order may be reversed. Before the ulceration of the tubercles and sphacelation of the fingers, &c. take place, the patients are able to follow their usual avocations without complaining of want of appetite, vigor, &c. In fact, all the functions of the body seem to be performed well and healthily, though the skin may be covered with numerous tubercles ; but when the disease has reached its *third* stage, the sufferers become daily exhausted, the action of the heart depressed, the skin dry and hot towards evenings, appetite lost, and sensorial functions more or less blunted. At last the miserable patients are carried off, exhausted by the progress of this horrible disease, by heetic fever, diarrhœa, or dysentery.

"It is to be remarked that these three stages do not occur in all cases in the order above described, nor with marked and distinct features. There are instances in which few blotches of discolored skin appear on the face or hands, &c., and these

are immediately followed by the eruption of tubercles. In such cases the first stage often passes unnoticed, though, so far as known, it always exists. There are some other cases, rather anomalous, in which the skin of the face and extremities, nay of the whole body, assumes, either slowly or rapidly, the characteristic brown or bronzed color, but instead of it being subsequently covered with tubercles, the prominences and furrows of the face, forehead, and other parts become better marked; thus the skin over the cheeks, eyebrows, and frontal eminences, &c. become tumid and elevated into what may be called diffused swellings, each of which presents an aspect as if made up of an aggregation of several small tubercles, and the whole gives a coarse appearance to the features. In this state the patients continue to live for a long time, and then are attacked with symptoms of the third stage, viz. ulceration and sphacelation of the fingers, toes, &c. Also the second stage is not followed by the third exactly in the way described. It happens that soon after the commencement of the second stage some few tubercles, though yet small, are often attacked with ulceration, which either destroys them completely down to their base, or only their summits. The resulting ulcers being small, and the powers of the system not yet lowered by the influence of the disease, heal more or less rapidly. Then some other tubercles pass through the same process, and thus in fact the ulceration of tubercles is going on almost from the commencement of the second stage, but the ulcers being small, they heal rapidly. After a time, however, the tubercles being gradually increased in size and number, suppurate, and leave more or less large ulcers, which show little or no disposition to heal, from the general debility brought on by the prolonged influence of the disease upon the system; and simultaneously with these changes mortification of the toes and fingers takes place. Lastly, the tubercles may completely disappear by absorption and ulceration, and be replaced by ulcers on the hands and feet, &c., characteristic of the anæsthetic leprosy. In the anæsthetic variety the fingers and toes are shortened, and sometimes reduced almost to a fleshy point, by the interstitial absorption of bones. Such a process, it appears, never takes place in the tubercular leprosy.

"I have not hitherto alluded to insensibility, as this is not a very prominent symptom of the disease, at least at its commencement. It is already stated that the discolored spots of brown colour, with which the disease commences, are in some cases painful, especially when their eruption is attended with febrile symptoms, but after some time they regain their ordinary sensibility, which becomes impaired after a long time, only and especially on those spots which are the thickest. Tubercles also at their commencement may be more or or less over-sensitive, and they never or very seldom lose the sensibility when still small; but when they have attained a large size, they become completely insensible, and may be touched even with the knife, without the patient complaining of pain. It is to be noted, however, that if an insensible enlarged tubercle is pressed against the subjacent parts, the patient will complain of pain, but this is not referred to the tubercles, but to the parts against which it is pressed. When the disease has existed for a long time, or when the tubercles begin to ulcerate, and the fingers and toes slough off, the sensibility of the skin in general is impaired or completely destroyed, chiefly in the upper and lower extremities, and of these that of the latter is first affected. Anæsthesia may manifest itself earlier, if there be a complication of both varieties of leprosy."

Case No. 1.

M. B., aged 40, a Parsee, cook, native of Nowsaree, and resident here for the last six years, was admitted into the Jamsetjee Jejeebhoy Hospital on the 15th October 1851.

On each side of the face, and over the cheeks, there are circular patches of elevated cutis, of a pale red colour, of about the size of a rupee. On the alæ of the nose and back part of the ears and arms there is also commencing thickened state of the cutis. The skin of both hands, fingers, feet, and toes, are swollen and glistening. Patches of thickened skin are also seen here and there on both the knees, legs, and ankles.

The sensibility of the affected portions of the skin is defective, except of the leg, where some pain is complained of on pressure. There is a small superficial ulcer on the right middle finger. States that the thick patches of the skin made their appearance first on the cheeks about a year ago, not being preceded by any constitutional disturbance, and that similar ones appeared afterwards on the arms and legs; that the disease has been rapidly increasing for the last two or three months. The swollen state of the fingers and the ulcers on the right middle finger have existed only for the last fifteen or twenty days. Further states that he suffered from gonorrhœa about a year and a half ago, for which he was twice salivated. Does not admit that any member of his family suffered from a similar complaint.

This patient was under clinical observation during the months of October, November, and December 1851, and January 1852, when he was attacked with cholera, and died.

During the early part of November and the end of December he suffered from febrile symptoms, head-ache, and itchiness of the body in general for two or three successive days, and these were followed by the appearance of fresh patches, tender on pressure, on the back of the ears, face, arms, hands, &c., and of several small ulcers on some of the toes of both feet.

Case No. 2.

M., aged 35, a Hindoo, cart-driver, born and resident in Bombay, was admitted into the Jamsetjee Jejeebhoy Hospital on the 10th of July 1851 with chronic ophthalmia and opacity of both corneæ of two months' standing. On the 28th the inflammation of the conjunctiva was better, and the opacity of both corneæ less. The cilia and the hairs of the palpebræ are absent. The face is somewhat enlarged and deformed by the presence of numerous tubercles of the size of a split pea. The nose also is enlarged and deformed by a similar eruption, and especially by the falling in of its alæ, the inner surface of which almost touches the floor of the nares, the columna being doubled upon itself. The ears and lips are also enlarged, the latter being mottled red and white. Numerous tubercles, similar to, but larger than those on the face are also observed over the upper and lower extremities, and upon the trunk, where they are aggregated into patches. On the fingers of both hands there are several white cicatrices. The skin of almost the whole of the body is brown colored, and shining as if oiled. States that the disease commenced about five years ago by the formation of a small patch of tubercles on the cheeks, followed by similar ones on the ears and other parts of the body; that they have increased since, and the nose has become deformed since the last seven or eight months. States also that the sensibility of the parts studded with tubercles is gradually lessening. Had primary syphilis about seven years ago, of which he got cured without any medicine. He remained as an inmate of the hospital till the 16th of December, when he was discharged at his own request.

From the 1st to the 6th of October he suffered from fever, and both his hands became swollen, tense, and painful. On the 7th he was free from fever and the swelling of the hands, but fresh tubercles appeared on both hands. During his stay in the hospital he complained frequently of head-ache, and passed daily mucous tinged with blood from the nose. It was also during his stay in the hospital that the general sensibility of the hands, fore-arms, feet, and legs began to be gradually impaired.

Case No. 3.

H. B., aged 40, a Mussulman, beggar, was admitted into the Jamsetjee Jejeebhoy Hospital on the 4th July 1851.

The face, chiefly about the cheeks, is enlarged. The alæ and tip of the nose are fallen in, so as to close in the interior nares. The cilia and hairs of the palpebræ and beard are entirely absent. The skin of the face is whitish in points, and shining. He complains of pains of the fauces. The soft palate and posterior wall of the pharynx is vascular, and very irregular from numerous elevations and depressions, the latter resembling some old puckered cicatrices. Situated towards the superior part of the neck there are two swellings, one on each side, both about the size of a hen's egg, soft, elastic, and not painful. There is a similar swelling upon the right arm, and one on the palm of the right hand. The left thumb is much swollen, and purulent matter is discharged through a small opening situated near the joint between the second and last phalanges. The left little finger is shortened by some old ulceration. The left foot and the second left toe are swollen. Voice is husky, occasional cough, sputa puriform, respiration calm, and is attended with a loud hissing noise. No dulness anywhere in the chest. Respiratory murmur is obscured by the hissing noise. States that the disease has existed for the last eight years; that the deformity of the nose has occurred only during the last two months.

30*th July*.—The swelling on the palm of the right hand noticed on admission has burst, and left an opening in the centre, and there are two or three small openings in the left hand between the index finger and thumb.

He continued in this state till the 10th of the following month, when he was discharged at his own request.

Owing to few observations made after death, Mr. Lisboa has little to add respecting the morbid anatomy of the tubercular leprosy. He has not observed any deposit of tubercles on the surface of any of the mucous or serous membranes.

The diagnosis between this disease and syphilitic eruptions refers to, 1*st*. *Copper colored syphilitic blotches* of the skin, which are essentially a scaly eruption, not raised above the surrounding integuments, nor shining, and differing also in color. 2*nd*. *Tubercular syphilitic eruptions*, which are also scaly, and the tubercles have a thickened scaly epithelium, and are *over*-sensitive. The history of the case also assists the diagnosis.

The prognosis, as in the anæsthetic form, is always unfavourable.

The causes of the disease Mr. Lisboa thinks may be traced in many cases to bad food, such as "*salt oily fish*," or food otherwise of inferior quality, but he thinks with reference to other alleged causes, that little reliance can be placed upon the testimony of the generality of the patients frequenting the hospital. The proximate cause of the disease doubtless resides in the blood.

Mr. Lisboa concludes his paper by an analysis of 28 cases of both forms of the disease, as to caste, age, sex, country, habits, and hereditary predisposition, of which the following is an abridgement :—

Caste,—Hindoos 21; Portuguese 4; Parsees 2; Mussulmans 2; Indo-Briton 1.

Age,—Between 10 and 20 years, 2.
20 „ 30 „ 11.
30 „ 40 „ 7.
40 „ 50 „ 3.
50 „ 60 „ 5.

Sex,—Males 21, females 7.

Country,—Born in Bombay or its vicinity, 13. Elsewhere, 15.

Occupations,—Beggars 10. Following some laborious occupation 18.

Habits,—All more or less addicted to spirituous liquors and the use of tobacco or opium.

Hereditary Predisposition,—Traced in several instances, although generally denied.

Contagion,—No instance seen in which the propagation by infection could be proved.

No. 4.

Fatal Case of Rupture of the Bladder. By A. Wright, Esq., Surgeon, 2nd Battalion Artillery.

Presented by the Medical Board.

A Gunner of Artillery, 26 years of age, in good health, after having been "*drunk and riotous*" the previous evening, was admitted into hospital on the morning of the 15th August 1854, with symptoms of acute peritonitis, for which he was actively treated.

In the evening inability to pass urine was complained of, "but there was no distension of the bladder, and on introducing a catheter it was found empty, and contracted." The next day the symptoms became more aggravated, and he died at 7 A. M. of the 18th.

On a *post-mortem* examination at noon all the organs were found healthy, except in the abdomen. "The intestines were greatly distended with flatus, and the peritoneal covering deeply injected and inflamed. About three pints of dark bloody strongly ammoniacal fluid was in the cavity of the peritoneum. The bladder was contracted, with a large rent in the posterior part of the fundus; blood was effused round the lacerated part, and its edges were contracted and rounded. There was no appearance of a bruise over the bladder, but in the fibres and sheath of the rectus muscle blood was effused to a limited extent."

No. 5.

Case of Cataract, treated at the Kurrachee Dispensary. By Mr. J. C. Lisboa, Sub-Assistant Surgeon.

Presented by the Medical Board.

A Christian, aged about 28, was admitted July 20th 1854 with cataract of both eyes, that in the right eye being fully formed. It was attached on the inner side to the posterior surface of the iris by a small pedicle, and at each movement of the globe of the eye it floated freely from behind forwards. The cataract of the left eye is not yet complete.

Operation.—After introducing the needle into the posterior chamber, it was found very difficult to seize the opaque body, for at the gentlest touch it receded towards the posterior and inner side of the globe. However, I succeeded in seizing it about three times, and dividing it into several pieces.

Inflammation of the conjunctiva and sclerotic coat came on, but was readily subdued by the application of two dozen leeches, and administration of calomel so as to affect the system.

He was discharged at his own request on the 20th day, when the following was registered in the Dispensary case :—" Redness of the conjunctiva and sclerotic coat is gone ; pain none. The cataract is absorbed, except the pedicle by which it was attached to the iris. He can see with the right eye, and distinguishes well small objects placed at a short distance."

About eight days after his discharge I saw the man at his own residence in the military cantonment, and found that the remaining pedicle was smaller. It is being absorbed, and the power of vision is increasing.

It appears that in this case the crystalline lens was already absorbed by some cause or other, and there remained only the opaque capsule operated upon. In fact, this case was one of *siliquose* or *membranous* cataract.

The patient stated on admission that he had undergone no previous operation on the right eye, nor did he remember having received any blow over it.

No. 6.

An account of an Anthelmintic used in Abyssinia; with a Notice of some rare Diseases of that Country. By H. O. Thorold, Esq., Assistant Surgeon.

Presented by the Medical Board.

Moossinna is the name of a medicine used by the Abyssinians to expel tape-worm. It is the powdered bark of "a fine handsome tree" which grows on the Shilio Hills, near Massowah. The writer could not obtain a specimen of its flower or seed, and is unable to assign its botanical place. The bark is stripped off in the dry season, exposed to the sun, and powdered. It has an agreeable bitter astringent taste. Two table spoonsful of the powder, with double the quantity of linseed powder, and of honey, are made into a sort of cake, and eaten at bed time. No liquid is taken for twelve hours, and three days after "a strong purge of koossoo" is given. "In obstinate cases this is repeated every eight or ten days." The author adduces four instances in which he administered it (without the koossoo) to European sailors, "in every one of which," he says, "it has certainly been productive of great relief." "The effects appear to be astringent." The patients took the medicine as above described, but complained of "distention and weight in the lower part of the abdomen," but which disappeared after a common purgative. Yellow, shrivelled segments of the tape-worm were then expelled.

Mittal, or Wind Stroke.—A disease peculiar to Abyssinia, attacking "those coming down from the high land in the interior to the low country round Massowah," supposed by the inhabitants to be caused by either a stroke of wind, or "by the refraction of the sun's rays in water." The author saw one case. There was partial paralysis of the left side of the face, and the whole of the skin of the body was discoloured, as if stained by a solution of nitrate of silver; portions had peeled off, and the parts underneath were natural and healthy. No particular treatment is adopted for it.

Booda, or *Melancholia Abyssinia*, is a disease affecting only the natives in the district around Massowah, and both men and women are subject to its attacks. It is recognized by great despondency, perverse silence, and seclusion on the part of the patient. It is not attended with fever, but the pain undergone resembles acute rheumatism, whilst many of the symptoms are similar to those of hysteria. It is treated by making the patient swallow a nauseous compound, which after a time is successful in curing or removing the disease.

No. 7.

Case of Snake-bite. By J. C. TRESTRAIL, Esq., Assistant Surgeon.

Presented by the Medical Board.

At Asseerghur, on the 2nd September 1854, a Mallee whilst at work was bitten on the middle finger of the left hand by a snake. He soon became insensible, and collapsed. A ligature was put round the finger, the part scarified, and stimulants administered. A convulsion came on when recovering from the collapse, and two fluid drachms of liquor potassæ arsenitis, with an aromatic, and ten minims of tincture of opium, were given, and directed to be repeated every half hour. The insensibility continued for four and a half hours, and the convulsive spasms occurred about every ten minutes, until after *five* doses of the mixture were taken, when the spasms became less frequent. The sixth dose of the medicine was rejected by vomiting, and the man recovered.

No. 8.

Case of Caries of the Bones at the Base of the Cranium. By Assistant Surgeon FOWLER, H. M.'s 8th Regiment.

Presented by the Deputy Inspector General of H. M.'s Hospitals.

The disease was upwards of a year's duration, during the whole of which period, and to the last moment of life, the intellect remained unimpaired. The illness first commenced, after exposure to wet and cold, with deafness and discharge from the right ear, the pain soon extending over the whole head, coming on in severe and most excruciating paroxysms. Subsequently a large, tense, obscurely elastic tumour appeared in the back part of the hard palate (right side), extending backwards towards the pharynx, but from the co-existing anchylosis of the lower jaw manual examination was very limited; its progress was attended with increasing difficulty of deglutition, occasional slight hæmorrhage from mouth and nostrils. He had suffered about two years previously from syphilis. Death occurred by way of asthenia.

Post-mortem examination.—External appearances. Most extreme emaciation, body reduced almost to a skeleton.

Head.—Dura mater and membrane perfectly healthy; very little serous fluid beneath the arachnoid; cerebral vessels filled with blood, but not congested, tissue of brain firm and natural, puncta vasculosa not numerous, a small quantity of fluid in lateral ventricles, and about one or two drachms at base of brain, where the membrane appeared also healthy. On disarticulating the lower jaw, the right coracoid process was scarcely thicker than a sheet of writing paper, and perforated by caries. The articular surface of the condyle also in a state of caries. On following up the examination, a soft elastic swelling extended over the whole of the hard palate, back into the pharynx, and behind the pterygoid processes on the right side. Having been laid open, it was found to communicate with the under surface of the bones at the base of cranium on the same side, which were completely eaten away by caries, breaking up on the slightest pressure, and leaving an opening about the size of a shilling, communicating with the cavity of the brain, over which the dura mater passed, apparently unaltered. The diseased surface included the anterior margin of the petrous portion of the temporal bone, which assists in forming the foramen lacerum; the outer margin of the same bone, and contiguous part of the greater wing of the sphenoid, where it stretches back into the spinous process; in fact, the angle of junction between the petrous and sphenoid bones. On removing completely the dura mater, the grooved bony canals of the meningeal arteries terminated abruptly on the margin of the carious opening; externally the tissues were matted together, and infiltrated with purulent serum.

Chest.—Numerous old pleuritic adhesions on both sides; both lungs were extensively and similarly diseased; their upper lobes tolerably crepitant, containing an unusual quantity of serous frothy fluid, the lower ones presented appearances of grey hepatization, or purulent infiltration, soft in texture, easily breaking down, and thick matter oozed out on section.

Pericardium healthy. Heart small, flabby, and walls thin; in other respects healthy.

Abdomen.—Liver somewhat enlarged and slightly congested. Stomach small and contracted, otherwise natural; small and large intestines natural in appearance, but contracted. Spleen natural; kidneys pale and large, otherwise healthy.

No. 9.

Case of Popliteal Aneurism; Ligature of the Femoral Artery. By G. Naylor, Esq., Assistant Surgeon.

Presented by the Medical Board.

In August 1853, a Portuguese writer at Sukkur, 40 years of age, of spare and

temperate habits had suffered for four months from a small swelling in the right popliteal region, about the size of a nut, which, during the last five weeks, had considerably increased. At the period of examination the tumour was the size of an orange, globular, and pulsatory. Its surface was smooth, and it was not adherent. The circumference of the leg at the part, compared to the opposite, was increased by three inches. The man's health was pretty good; he had no hereditary complaints, and the heart's sounds were natural.

On the 1st September 1853 Mr. Naylor tied the femoral artery, "in the usual way in the upper third of the thigh," but without using chloroform. "Having passed the ligature round the artery, the flow of blood in the tumour was immediately arrested upon tightening it." "The artery was secured, and both ends of the ligature were left hanging from the lower part of the wound, which was brought together by strapping, and dressed with cold water." The patient did well after the operation, but upon the 8th September hæmorrhage to some extent came on, but which was arrested by pressure.

On the 18th of September "the ligature came away without any trouble," and from that time, up to the 11th November, he continued to improve, and was discharged cured, the circumference of the leg being reduced to within half an inch of the sound one.

No. 10.

Case of Hepatic Abscess, opening into Pericardium. By Assistant Surgeon Fowler, H. M.'s 8th Regiment.

Presented by the Deputy Inspector General of H. M.'s Hospitals.

S. L., a private, tall, thin, and delicate, several of whose relatives had died of phthisis. Had been $3\frac{8}{12}$ years in the army, of which time $3\frac{1}{2}$ in India. Suffered from febris remittens last year for a few days; not ill since, though he has always been delicate.

Admitted 3rd August complaining of dyspnœa, very slight cough, pain in epigastric and in right hypochondriac regions, increased by inspiration, and relieved by sitting up in the semi-recumbent position. Says he perspires profusely every night.

There was dulness on percussion under both clavicles, pectoriloquy and tubular breathing; the dulness was greatest on left side of chest. He continued in a weak state, with little alteration in symptoms until the 29th August, when he was suddenly attacked with a very severe paroxysm of dyspnœa; his breathing in the erect position was very difficult, and when he was placed in the horizontal he was almost suffocated. His skin was cold and clammy, his pulse quick, fluttering, and almost

imperceptible; his face anxious; he did not complain of much pain in epigastrium, but said "he had a feeling of suffocation in that part."

On the 30th he was better, his breathing was easier, his pulse rather stronger, his skin warmer. Severe diarrhœa now came on, and he died on the 5th September.

On inspection of the body seven hours after death, the following appearances presented themselves:—

External.—Body much emaciated, marks of blistering over cardiac region, and of leech-bites and cupping on chest.

Thorax.—On opening this cavity, much fluid escaped from the left pleura, in all about four pints. The left lung was adherent at its upper part, below there was an aperture in the lung communicating with the pleura. The upper lobe was full of tubercles, and there was also a vomica in the same lobe.

Right Lung also adherent at its upper part, and contained crude as well as softened tubercles.

Heart.—Pericardium full of pus, communicating with an abscess at the upper surface of the liver, by an ulcerated opening through the diaphragm and pericardium.

Abdomen.—Liver large, its substance healthy; between its upper surface and the diaphragm was an abscess with distinct walls, not connected with the substance of the liver, and communicating as before mentioned with the pericardium by an ulcerated opening. Other abdominal organs healthy.

No. 11.

Case of attempted Suicide of a Sepoy by Fire-arms. By T. M. Lownds, M.D., Assistant Surgeon.

Presented July 1853.

About the middle of August last I was called at 2 A. M. to see a sepoy of the regiment who had attempted to shoot himself. He first loaded his musket with ball cartridge in the usual way, and, to avoid observation in the guard-room, replaced the plug. He went outside for a few minutes, when a report was heard, and he was found just outside, with his musket recently discharged, and the clothes round his chest burning. (The usual undress of the corps is a green cotton tunic.) He had placed the muzzle of his musket, with the plug still in it, either very near or touching his chest, and had fired. I saw him within a few minutes, and could not on examination find the smallest evidence or mark on his chest that the ball had struck him. A large burn, oval in shape, extended over a great part of the front of the chest, but in no part could I find abrasion, or sign of a blow. The

burn was superficial; the ball was found close to the spot where he was standing. It was imbedded or spiked in the plug, and this latter was somewhat scorched. The patient appeared during the time he was afterwards in hospital to be in low spirits. The burn healed slowly.

The question which first presents itself is, how was it that no mark at all was found? The plugs in muskets fit somewhat tightly, so that air can only pass slowly. I think it probable that as these plugs allow air to pass only by degrees, the air between the ball and the plug might become so much condensed before it all passed the plug, that the speed of the ball would be very much lessened before it impinged on the bottom of the plug. In this case the air acting as a recoil valve, and more especially if the top of the plug was in contact with, or rather set against his chest, the force of the ball and plug being driven out would not amount to much.

A few cases which seem to bear out the possibility of the plug preventing the ball from being discharged with any force are those which we see occasionally recorded in the journals of the day, in which fowling pieces have burst from a small quantity of earth or other matter, accidentally introduced, blocking up the muzzle of the gun, causing the force of the explosion to be expended laterally. A case in which snow thus introduced, but for a very short distance, caused a gun to burst, fortunately without injury to the sportsman, has been recently brought forward.

Again, it might be supposed that in the perturbation of loading for such a purpose, his hand might be somewhat unsteady, and in this way spill a portion of the gunpowder.

The extent of the burn and the spiking of the bullet, or the plug, proved that at least a large portion of the powder reached its usual destination.

The case is curious, and may perhaps be useful as a precedent in medico-legal medicine.

No. 12.

Case of Swallowing Pounded Glass. By R. Haines, M. B., Assistant Surgeon.

Presented by the Grant College Medical Society.

G. K., an artist, Mahratta, aged 25 years, was admitted into the Jamsetjee Jejeebhoy Hospital 30th August 1852, ¼ to 4 P. M., in charge of a police peon.

The policeman says the man was seized in the act of committing a robbery, and that either on his way to the gaol, or soon afterwards, he broke up and swallowed a quantity of glass of a bottle. The remainder of the bottle was produced—a reddish brown quart bottle, such as Rhenish wine is imported in.

The man complained of a little pricking sensation in the throat and stomach; no febrile symptoms were present.

An emetic of sulphate of zinc was immediately given; milk diet, bread.

5½ P. M.—Has vomited several times; the vomited matters consisted chiefly of the bread and water he had swallowed since admission, but contained no pieces of glass. There is considerable tenderness at the epigastrium, and he complains a little of frontal head-ache.

An ounce of castor oil was given.

31*st.*—Bowels open two or three times, stools yellow and loose, not bloody. At the bottom of the vessel were found a number of pieces of thin bottle glass, precisely corresponding with the remains of the bottle shown by the policeman. There were about twenty fragments of various sizes, the largest an inch long by a quarter of an inch broad, the smallest as large as a grain of rice. Still much tenderness at the epigastrium, but no heat of skin, or unusual quickness of the pulse.

Eighteen leeches to epigastrium; fomentation.

September 1*st.*—No evacuation since yesterday, less tenderness at the epigastrium, continue the fomentation; diaphoretic mixture an ounce every three hours.

2*nd.*—No evacuation; no fever; still some uneasiness at the epigastrium continues.

3*rd.*—Bowels continue costive; rather more tenderness. Castor oil an ounce to be given immediately in cinnamon water.

Sinapism to epigastrium.

4*th.*—Bowels freely moved, no more fragments of glass have been observed; less tenderness.

Repeat the sinapism.

5*th.*—Still some tenderness at the epigastrium; tongue covered with brown fur; skin and pulse natural.

Dilute hydrocyanic acid 3 minims in an ounce of infusion of chiretta every four hours.

6*th.*—Complains of pain and puffiness in the epigastric region; stomach appears rather inflated, but is not very tender.

Continue.

7*th.*—He is now pretty well. Discharged.

Cases such as these are by no means infrequent in this country, the idea of the poisonous nature of pounded glass being even more generally received amongst the natives of India than of Europe. It is generally taken for the purpose of committing suicide. One or two other cases have come under my observation since the one above mentioned. Where such large fragments, slender and sharp-pointed, have been swallowed, some degree of danger must always exist of the pieces sticking crosswise in some portion of the intestinal tube, and producing ulceration, which might lead to the laying open either of a large vessel or of the cavity of the peritoneum. Hence it would be always advisable to keep the patient under observation for ten or twelve days, by which time symptoms of such ulceration, if the latter existed, would manifest themselves.

The irritation in the present case was less perhaps than might have been expected under the circumstances.

No. 13.

*Case of Poisoning by Opium, treated at the Bhooj Dispensary.** By Mr. Sadashew Hemraj, Sub-Assistant Surgeon.

Presented by the Medical Board.

"A man of spare habit, and about 25 years of age, was brought to the Dispensary by his friends, who stated that he had taken some opium with a view to poison himself. On admission he complained much of giddiness, and there was much drowsiness about him. His pupils were contracted and insensible to light, his pulse small and frequent, and he was profusely perspiring. An emetic of 25 grains of sulphate of zinc was given him, but it did not operate, when the stomach-pump tube was introduced, and some tepid fluid thrown in and removed, but no opium could be detected, but it smelt of assafœtida, which was given to him before he was brought to the Dispensary. After that he was made to walk about assisted by two men, but in about an hour stupor came on, and to such an extent that it was impossible to make him move, when he was placed on a chair, and electro-galvanic shocks were passed along the spine and back of the neck. Under this he improved, and became alert, when he was again made to walk, assisted by two men. In about a quarter of an hour stupor again came on, and the electro-galvanic shocks were repeated. In about three hours he was much better, there remaining slight drowsiness only. After recovery he said that he had taken about three drachms of opium, four hours before he was brought to the Dispensary, and that he had not taken any food for sixteen hours before that."

No. 14.

Case of Poisoning by Aconite. By J. Peet, Esq., Assistant Surgeon.

Presented October 1854.

Bappoo Kishnura, a Hindoo priest, aged 50, was admitted into the Jamsetjee Jejeebhoy Hospital in the afternoon of the 4th August 1854.

He stated that for twenty-four days he had been taking daily fifteen grains of a Native drug called "bishnak" (a root of the Aconitum ferox) as a remedy for leprosy, from which he had suffered for several years. Until the morning of the day of his admission he had been using the *black* variety of the drug, but at the

* Extracted from the Monthly Return.

recommendation of a friend, he substituted the *white* variety, in the expectation that it would be more effective than the former, which did not appear to have much influence either upon the system or the disease. The dose was fifteen grains, and was taken in the morning about 10 o'clock. He soon afterwards began to feel uneasy, had a disagreeable burning sensation in the mouth and fauces, a sense of formication, and some confusion of mind. A friend recommended milk, of which he drank a large quantity. Soon afterwards he vomited freely, and about an hour after the vomiting came on, and about four hours from the time of taking the drug he was brought to the hospital. He was then sensible, had a stupid expression of face, and walked with an unsteady gait, like a drunken person. He complained of heat and burning of the throat, some confusion of mind, and of a sense of formication over the surface generally. There was almost constant vomiting. Pulse feeble and rapid, skin coldish, and covered with moisture ; pupils natural. A sinapism was applied to the epagistrium, and stimulants of ammonia were administered.

The vomiting continued till 12 o'clock at night, after which he fell asleep. On the following morning the skin had gained its warmth, and the pulse was better. The sense developed of heat about the throat had subsided, but he still walked with much difficulty. There was no return of the vomiting. He was urgent for his discharge, and went home in the course of the day.

No. 15.

A Case in which a portion of Brass Wire was found in the Transverse Colon after death. By J. Y. Smith, Esq., Assistant Surgeon.

Presented by the Medical Board.

A sepoy of the 8th Regt. N. I. when at Kurrachee was admitted into hospital on the 11th January 1853, with "pain and swelling in the left epigastrium, where a distinct hard, knotted tumour can be felt" ; had constant vomiting and constipation of the bowels. He was treated by leeches, blisters, fomentations, and the application of iodine externally. Purgatives and creosote were given, and turpentine enemas administered.

He continued daily to get worse, and died on the 10th March.

Post-mortem appearances fourteen hours after death.—Emaciation extreme. " On laying open the abdomen, a considerable quantity of fluid escaped, and an irregular tumour (fixed) was brought to view, in which were involved the omentum (thickened and puckered), the transverse arch of the colon, the duodenum, hepatic

vessels, &c. A few patches of lymph were seen on the peritoneum ; and the spleen, which was of unusual size, was covered with a soft white layer of lymph. The stomach was much enlarged, and contained fluid and air ; its vessels were distended, and its coats thickened to the extent of nearly half an inch in the neighbourhood of the pylorus. No ulceration was detected. The opening into the duodenum and this gut itself were contracted, and its lower two-thirds imbedded in organized lymph. The jejunum, ilium, caput cæcum coli, and ascending portion of the colon looked healthy, but the transverse arch of the last was fixed, and its posterior surface imbedded in the mass of the tumour. On laying open this part of the intestine, a piece of *brass wire*, thin, curved, elastic, and about an inch and a half in length, was found, one end of which had pierced the gut, and was covered and protected by the thickened omentum; the small opening through which it appeared was regular, and rounded, as if for the passage of a nerve. The wire passed freely through it, and the lining membrane of the gut presented no trace of recent ulceration. There was general thickening of the coats, as well as of the duodenum, and these two portions of intestine were matted together. The communication between them no longer existed, although appearances are in favour of the wire having passed directly from the one to the other. Chyle and imperfectly-formed fæces were found in the intestine. These morbid appearances sufficiently explain the symptoms that were observed during life, and which were attributed to an affection of the spleen or mesenteric glands. It appears that the man must have continued to perform his duty long after he swallowed the wire, as the tumour was quite distinct when he was first admitted into hospital. Possibly, this substance, which is not thicker than a needle, may have found its way into the system through the walls of the abdomen without creating much disturbance, until some of the organic changes above described had taken place."

No. 16.

Case of Protrusion of the Intestine, and Recovery. By C. G. Wiehe, M.D., Civil Surgeon, Sattara.

Presented by the Medical Board.

A Hindoo, about 45 years of age, was brought to the Civil Hospital at 11 o'clock A. M. of the 18th January 1853, with about four feet of the intestines protruding from a wound in the right iliac region. The wound was caused by falling upon a sharp-pointed piece of bamboo. The intestine was not injured. It was returned, and the wound brought together by sutures and adhesive plaster. Inflammation came on, but it was subdued by leeches, fomentations, purgatives, &c. The wound healed by the first intention, and the man was discharged cured on the 13th February 1853.

No. 17.

Medico-legal Cases. By H. J. Carter, Esq., Coroner's Surgeon, Bombay.

Presented August and October 1854.

Case 1.—*Hæmorrhage and Death from Laceration of the Parietal Vein.*

On the 22nd instant I was summoned by the Coroner to examine the body of a Parsee named Framjee Dorabjee, who had been a compositor in the office of the "Bombay Gazette" newspaper; he was said to have been about 32 years of age.

The evidence taken before the inquest showed that he was addicted to intoxication, and that about midnight he had drunk about half a wine bottle of spirituous liquor, called "mowrah," in company with some of his friends, on the Esplanade. The party then went to purchase some sweetmeats in the Native town, and on their way back to the Fort passed the deceased's house, where they wished him to remain, as he was intoxicated, but he persisted in accompanying them to the Fort; and on arriving at the glacis, they all sat down together for a short time, when the deceased went to sleep, but on being roused, and asked by his friends to come on, he was unable to walk; in consequence of which a buggy was brought, and while two of the party were engaged in carrying him to it, he struggled, and fell with his head against a stone; this caused a wound of the scalp, from which blood began to flow. The deceased then requested to be taken to a liquor shop in Hunumun Gully, about two miles distant, whither he was conveyed, and placed on a bench in a small room, about two o'clock in the morning. There he went to sleep, and was not seen again until 5 o'clock, when the servant of the liquor shop found him breathing heavily, and at 7 he died, that is, about six hours after the receipt of the wound.

Post-mortem examination ten hours after death.—The body was lying on the floor of a small room, with a pool of blood in a state of semi-coagulation under the head. About two pints of blood were probably present, but it is impossible to state how much there had been altogether, as a great part of the serum might have been soaked up by the earthen floor. The head and neck were slightly livid, as in death from apoplexy; there were no traces of disease about the body, and no marks of violence, except a small lacerated wound, about an inch long, over that part of the sagittal suture where the parietal foramen generally exists. This wound had not extended to the bone; and although insignificant in appearance, it was evident that the blood about the clothes bound round the head, and that on the floor, had come from it. On raising the scalp no extravasation of blood appeared on any part of the cranium except opposite the wound, where there was a spot about two inches in diameter, immediately around the parietal foramen, which in this instance was single, and on the right side of the suture. The parietal vein was evidently lacerated; and to give an idea of its size, the foramen by which it entered the cranium was about a twelfth of an inch in diameter. There was no fracture in this or in

any other part of the skull. The brain appeared to be more congested than usual, and there was a little fluid in the ventricles. There was no extravasation of fluid in the substance of the brain, nor anywhere in the interior of the cranium. Neither the chest nor the abdomen were examined.

Observation.—My evidence in this case was that the deceased died of hæmorrhage from the parietal vein; but on reflecting on the rapidity with which the blood becomes fluid in this climate, and the determination of it to the head in this instance probably from intoxication, I think, on another occasion, I should modify this opinion by adding that the deceased might have died from apoplexy brought on by drinking spirituous liquors, and the effusion of blood may have taken place after his death. Certainly, if experience did not point out that in this country nearly all the blood in the body occasionally flows out of an almost insignificant wound of the head or neck within a few hours after death, (if the body be in a horizontal position,) there are some cases in which it would be difficult to say whether the wound was made before or after death, and whether the blood which had come from it was from active hæmorrhage or simple exudation. In the case in point, however, if death was caused by apoplectic congestion, (and there was no sign present but a slight lividity of the head and neck to support this view,) it was at least a very unusual occurrence that it should have been accompanied by a wound of the parietal vein.

CASE 2.—*Death from a Wound of the Left Vertebral Artery, between the Transverse Processes of the Third and Fourth Cervical Vertebræ.*

Amajee Narain, aged 25, a Police Naique, was stabbed in several places by another policeman when on duty at 5 A. M. on the 26th September 1854. The wounds were inflicted with a double-bladed clasp-knife, both blades of which must have been open, as the wounds were double at each place. He was suddenly heard to cry out that he was wounded about the hour mentioned, and on another policeman coming to the spot he was found sitting on a bench, with blood flowing freely from a wound in his neck. He made no complaint, and soon becoming insensible, died about 6 A. M., that is, about an hour after the receipt of the wounds.

Post-mortem examination.—There were several marks of violence externally, viz. on the lower and front part of the chest on the right side, on the upper and front part of the chest on the left side; on the right temple, and on the left side of the neck, midway between the ear and acromion. At each of these places there were two wounds, one about three quarters, and the other about half an inch in length. They varied slightly in their length and in their distance from each other, but all were superficial, except the two in the neck. Here the largest and deepest passed behind the carotid artery and internal jugular vein, and between the œsophagus and vertebral column, terminating on the right side of the latter, but injuring nothing of any consequence in its course; while the small wound led directly to the interval between the transverse processes of the third and fourth cervical vertebræ, where it ended by partly dividing the vertebral artery.

On examining the body internally, no marks of violence or traces of disease presented themselves; the viscera of the chest and abdomen appeared natural and healthy, but there was little or no blood in the cavities of the heart.

When the clasp-knife with which the wounds had been inflicted was examined, both blades were found opened, and the little blade bent to one side, which

accounted for the difference in the distance between the double wounds at the different places and the direction which the small blade took to reach the vertebral artery.

CASE 3.—*Fracture on the Odontoid Process, and Dislocation of the Second Cervical Vertebra.*

W. G., aged 15, engineer apprentice on board the H. C. steamer "Ajdaha," was playing with a shipmate on the 18th August 1854, about 7 P. M., when, according to the evidence before the Coroner, he "tripped backwards over the chain cable, and slipped down," after which he looked up and laughed, and said "Help me up." On trying to rise he drew his arm out of the hole through which the cable passes down into the hold, and suddenly becoming convulsed, "gave a few gasps, and died." He did not appear to fall in the first instance with much force.

Post-mortem examination.—Dr. Shepherd, who examined the body, stated that for six months past the deceased appeared to be in good health; no marks of violence or traces of disease appeared externally. "On opening the back part of the neck I found a rupture of the ligaments connecting the first and second vertebræ with each other and with the head, and also a dislocation of the second vertebra, the odontoid process of which was fractured, and pressing on the spinal marrow. I am of opinion that the deceased's death has been accidental; the injuries above mentioned might have been caused by a sudden and violent jerking forward of the head. The deceased's body was perfectly healthy, and the immediate cause of death was asphyxia."—*Extracted from the Coroner's Records.*

Observation.—In this case the fall appeared to those who witnessed it to have been attended by so little force, that the fracture was attributed to the sudden exertion made by the boy to recover himself while in the act of falling, rather than to the effect of the fall itself.

No. 18.

Observations accompanying a Substance procured near Aden, and said to be used by the Somalies to Poison their Arrows. By F. S. ARNOTT, M.D., Surgeon.

Presented by the Medical Board.

In February 1853 Dr. Arnott had forwarded to him a watery extract, prepared from the root of a tree, which is described at page 154 of the last volume of the

Transactions as "Wabie," a toxicodendron from the Somali country on the Habber Girhojes range of the Goolies Mountains. The tree grows to the height of twenty feet. The poison is obtained by boiling the root in water until it attains the consistency of an inspissated juice. When cool, the barb of the arrow is anointed with the juice, which is regarded as a virulent poison, and it renders a wound tainted therewith incurable. Dr. Arnott was informed that death usually took place within an hour; that the hairs and nails dropt off after death, and it was believed the application of heat assisted its poisonous qualities. He could not, however, ascertain the quantity made use of by the Somalies, and doubted if the point of an arrow would convey a sufficient quantity to produce such immediate effects. He had tested its powers in some other experiments besides the ones detailed, and although it failed in several instances, yet he was led to the conclusion that it was a very powerful narcotico-irritant poison. He had not, however, observed the local effect said to be produced upon the point of insertion.

The following trials were described:—

1*st*.—A little was inserted into the inside of the ear of a sickly sheep, and death occurred in two hours.

2*nd*.—A little was inserted into the inside of the ear of a healthy sheep, and death occurred in two hours, preceded by convulsions.

3*rd*.—Five grains were given to a dog; vomiting took place after an hour, and death in three or four hours.

4*th*.—One grain was swallowed by a fowl, but no effect produced.

5*th*.—Three grains were given to a sheep, but without producing any effect.

6*th*.—A small quantity was inserted into the ear and shoulder of a dog, but no effect was produced.

7*th*.—Upon the same dog, two days after, the same quantity was inserted into the thigh; death occurred in less than two hours.

8*th*.—Seven grains were given to a sheep, without any effect whatever.

9*th*.—To a dog five grains were administered, but it was rejected by vomiting. This was again repeated on the following day, with the same result. On the same day four grains were inserted into a wound upon the same dog; it produced violent effects in ten, and death in thirty-five minutes.

10*th*.—To a sheep two grains in solution were given, without any effect being produced.

The *post-mortem* appearances observed were absence of all traces of inflammation, collapse of the lungs, and distension of the cavities of the heart.

Further Experiments of the Somali Arrow-Poison. By R. Haines, M.B., Assistant Surgeon.

Presented November 1853.

Having while at Ahmednuggur received from the Secretary a small quantity of Somali arrow-poison alluded to by Mr. Vaughan in his Notes on Articles of the Materia Medica, &c. published in the last volume of the Society's Transactions, and there called "Wabie," the following experiments were made with it:—

September 17th. 1st.—A small healthy rabbit was taken, and the skin over the hip being divided, a piece of the poisonous extract, about the size of a corn of wheat, was inserted into the cellular tissue beneath.

30 *minutes afterwards.*—Seems disinclined to move, breathing quicker, passed his dung.

1 *hour.*—Again passed his dung, followed by a little urine; has eaten a little.

1½ *hour.*—Appears quite to have recovered from his uneasiness, and has become as lively as before.

(This rabbit was made use of three days afterwards for experiment 3rd.)

2nd.—A full grown rabbit. Some of the poison being dissolved in water, a portion of the solution, corresponding to about 15 grains, was injected into an opening in the peritoneum, so large a quantity being used in consequence of the apparent absence of effect in the former case.

5 *minutes.*—He appears to be in pain, squeaking occasionally; slight convulsive retractions of the head and neck begin to take place; passed a small quantity of urine.

10 *minutes.*—The spasms are becoming more frequent, but are neither violent nor prolonged; respiration scarcely perceptible; he now fell on his side.

12 *minutes.*—Several severe general convulsions came on, and at the end of another minute he was quite dead, the pulsation being for the last minute quite imperceptible. The chest was instantly opened, but there was no movement of the heart whatever.

September 20th. 3rd.—The rabbit used for the 1st experiment was taken, and an attempt made to inject a little filtered solution into the jugular vein, which failed: from the large size of the nozzle of the syringe, a good deal of blood was lost. A portion of the solution, corresponding to about 2½ grains of the poison, was then injected into a small opening made in the pleura.

9 *minutes afterwards.*—Symptoms precisely resembling those in No. 2 began to appear

14 *minutes.*—Convulsions more violent; fell on his side.

16 *minutes.*—Died.

4th.—A portion of the poison, as much as could well be applied, was smeared over the square iron head of an arrow, and allowed to become dry. The arrow was then shot into the buttock of a goat with sufficient force to carry the head out of sight.

20 *minutes afterwards.*—No effect whatever having followed, the arrow was extracted. The poison had become softened, and was wiped completely off two of the sides, and partly off the two other sides. The animal appeared to suffer very little pain from the wound; he was kept for a fortnight, and then died, but not apparently from any cause connected with the wound. In fact, he was previously diseased. Unfortunately the seat of the wound was not then examined, but a few days previously it appeared to have healed of itself. In the rabbit of the former experiment three days after the insertion of the poison into the wound the latter was closed with a dry coagulum, and presented no marks of inflammation around it.

5th.—Two good-sized village dogs being secured, to each, after several hours' fasting, were given about five grains enveloped in meat. The smaller one chewed it a long time, and frothed much at the mouth. He appeared to swallow very little of it, but the larger one eat the whole up without difficulty.

After more than two hours, no effect whatever being perceptible in either animal, they were shot to get rid of them.

These experiments, though not altogether complete, certainly establish the fact that it is a poison of no very great activity. The quantity made use of in the 2nd experiment was too great to allow a fair deduction to be made as to its properties. When a fourth to a sixth of the quantity was employed in the 3rd experiment the same effects followed, but with rather less rapidity; death resulting in the one case in ten, in the other in sixteen minutes, although the death in the latter case was perhaps hastened by the loss of blood. The symptoms more resembled those produced by *nux vomica* than by any other agent. No apparent drowsiness; spasms slight at first, beginning in the neck, increasing in intensity, extending over the whole body, and finally stopping respiration, and with it the action of the heart.

Experiments 1st and 4th show that a moderate quantity, such as may be introduced on the point of an arrow, produced no sensible effect either on a goat or a rabbit, and it could scarcely be supposed that it would have more on a man than on the latter animal; and the 5th experiment proves that a full dose taken into the stomach produces no result within a reasonable time.

The extract appeared to have been very carelessly prepared. It contained much earthy matter, and even small stones, and a large proportion of what seemed to be oxidized extractive matter also was left undissolved when it was treated with water. Probably it was not a good specimen. It seems, however, to keep well, and shows no disposition to become mouldy.

Note by the Secretary.—The remaining portion of the Somali Arrow-Poison was, agreeably to a Resolution of the Meeting of the Society held in July 1853, entrusted to Dr. Giraud, for the purpose of making a chemical analysis. Owing, however, to his absence from Bombay on account of illness, Dr. Lownds kindly undertook the examination of the substance, but from the small quantity the analysis (as might, perhaps, have been anticipated) afforded no satisfactory result.

No. 19.

Extracts from Medical and Surgical Cases. By J. M. Bowie, Esq., Civil Surgeon, Hydrabad.

Presented by the Medical Board.

Case 1.—*Spontaneous Rupture of the Spleen.*

A Native, aged 28, was admitted into hospital on the 6th January 1854, with common continued fever. On the 8th he "complained of pain in the region of the spleen, increased by pressure," for which he was treated antiphlogistically. He died suddenly on the evening of the 11th of January. On a *post-mortem* examination all the organs were found healthy, except the spleen. "On putting the hand into the left hypochondriac region a large mass of clotted blood was felt, and when removed weighed about 2 lbs. There was no fluid blood in the general abdominal cavity. The spleen was firmly bound down by adhesions, and on removing it a fissure of nearly six inches in length and three in breadth was found in the inferior concave surface, filled with clotted blood. The gland weighed about 2 lbs."

Case 2.—*Popliteal Aneurism.*

A Native mounted policeman, aged 28, was admitted into hospital 27th August 1853. He stated that about two months ago, when dismounting from his horse, he felt something give way behind the right knee. Swelling and pain came on, both of which continued to increase. On admission there was a distinct aneurismal tumour in the popliteal space, which diminished on the femoral artery being compressed, but which did not admit (from the pain it gave rise to) of that mode of treatment being pursued. On the 29th the femoral artery was ligatured in the usual manner; the swelling diminished gradually in size; the patient went on well, but the ligature did not come away until the 19th September. He was discharged on the 23rd, and showed himself on the 7th November, when there was no appreciable difference between one leg and the other.

Case 3.—*Lithotomy.* No. 1.

A Mussulman laborer, aged 49, was admitted on the 20th June 1853, with symptoms of stone in the bladder. On the 22nd he was operated upon under chloroform. "The staff, being introduced, (and the stone felt,) was held by an assistant. An incision of about three inches was made, commencing an inch and a half in front of the anus, near the raphè, and ending behind the anus, having been carried midway between it and the tuberosity of the ischium. The skin, cellular tissue, and superficial fascia were divided by this; the fore-finger of the left hand was then passed into the wound, dilating it, and clearing away cellular tissue, the knife at the same time dividing a few fibres of the levator-ani muscle. The groove in the staff was felt for, the nail of the index finger placed in it, and the knife passing above it was entered and pushed on into the bladder, in a direction corresponding to the

external wound, merely dividing a few lines of the urethra in front of the prostate, and slightly incising that gland. The knife was then withdrawn, and the finger pushed on into the bladder, dilating the wound in the prostate as much as possible. The stone was felt, and held by the finger, while the staff was withdrawn, and the forceps was passed, withdrawing at the same time the finger. The stone was grasped, and after some difficulty, on account of its size, withdrawn. The parts bled freely; the transversalis perinei artery required ligature. A silver tube was passed into the bladder from the wound, and retained by tapes. The patient was then unbound, washed, and removed to a cot, where he remained in a lethargic state for about half an hour."

He progressed favourably. On the 25th the tube was removed, and on the 24th July the whole passage of urine was by the natural channel. He was discharged on the 5th of August.

"The stone was of the uric acid species, oval, weighed 3 oz. and 3 drs. (troy), measured 6 inches and a half in its greatest, 5 inches in its smallest circumference, whilst it was 2 inches and $\frac{8}{4}$ in the largest and 2 inches in the shortest diameter."

CASE 4.—*Lithotomy.* No. 2.

A Mussulman, aged 35, was admitted on the 8th November 1853, for hydrocele, which was tapped, and he was discharged on the 25th. On the 30th he was readmitted with symptoms of stone in the bladder, which was detected upon sounding. He had fever, with "acid urine," for several days, and remained under treatment till 12th December, when the operation of lithotomy was performed under chloroform, and a stone extracted of the uric acid species, which weighed 1 oz. and 7 drs. (troy). By the end of the month the man was quite recovered, and fit to be discharged.

CASE 5.—*Wound of the Plantar Arteries of the Left Foot: Ligature of both the Anterior and Posterior Tibial Arteries.*

A Mussulman laborer, aged 26, was admitted on the 30th May 1853. He stated that two days before a sharp piece of a chattie pot ran into his left foot, and that on its removal much blood flowed, which had continued to recur at intervals since. "There is a deep wound nearly in the centre of the sole of the left foot, and on the introduction of the finger a small pulsating swelling is felt at the bottom of the wound. The foot is painful and swollen, but there is no hæmorrhage now. Apply wetted lint and a bandage."

31*st*.—"During the night hæmorrhage came on, and a graduated compress was applied firmly over the wound.

1*st*.—"Hæmorrhage returned again this morning early, and a good deal of blood was lost (the bandage had been loosened on account of the pain). On being sent for, I considered it advisable to tie the posterior tibial artery. I did this in preference to enlarging the wound, and looking for the bleeding vessels, on account of the swollen condition of the neighbouring parts, and also from the depth of the wound, which would have required very considerable incisions to lay them bare. There was the risk, too, of increasing inflammatory symptoms, by division of tendons, &c. The posterior tibial artery was tied at the ankle, by making an incision on the inner side of the malleolus, half an inch from it, through skin, fascia, and

aponeurosis, opening the sheath, and separating it from its accompanying veins. Finding that hæmorrhage was not restrained by this measure, the anterior tibial was tied also. This was done by making an incision on the fibular side of the tendon of the extensor proprius pollicis, through skin and fascia." The incisions were dressed with slips of adhesive plaster, allowing the ends of the ligatures to hang free. Wetted lint was applied to the wound in the foot.

2nd.—" Doing well; there is slight discharge from the wound in the sole of foot; swelling of foot diminished. Poultice to the sole of foot.

3rd.—" The incisions are rapidly healing; applied fresh plaster, more discharge from wound. Continue poultice.

6th.—" The ligatures have both come away; doing well.

8th.—" Incision healed; wound doing well; foot the natural size.

13th.—" Discharged."

CASE 6.—*Caries of the Bones of the Right Foot, and Diseased Ankle-joint: Amputation below the Knee.*

A Scindee, cultivator, aged 38, admitted 4th May 1854, with extensive disease of the right foot, of thirteen years' standing. It was on admission greatly swollen and painful; there were numerous fistulous openings; the skin over the ankle-joint was ulcerated, and the joint itself stiff and useless. Flap operation below the knee was performed on the 6th May, and the stump entirely healed by the 8th June, when the patient was discharged.

" The lower ends of the tibia and fibula are rough, and denuded of periosteum; the bones of the ankle-joint ankylosed, and the whole of the bones of the tarsus more or less implicated. The diseased bones were forwarded to the Museum of the Grant Medical College, Bombay.*

CASE 7.—*Erectile Tumour of the Left Hand, with Aneurism of the Left Radial Artery.*

A Mussulman lad, aged 14, had been in hospital some time, under the care of a former Medical Officer before the following note was taken, on the 11th April 1853:—

" There is a considerable increase in the size of the left hand, which is in some parts firm, in others, soft, with a feeling of fluctuation, and pulsation; there is a good deal of pain in consequence of the swollen condition of the veins; on the apex of the index finger is a small ulcerated spot, which occasionally bleeds freely, re-

* This preparation forms No. 61 of the Catalogue of the Osteological Collection in the Grant College Museum, from which the following description is extracted:—

" No. 61."—" An interesting preparation of the bones of the right ankle-joint, and part of the foot amputated by Dr. Bowie, Civil Surgeon, Hydrabad (Scinde), in consequence of extensive *caries*, of thirteen years' duration."

" The lower end of the tibia is but little diseased, as is usual in such cases, but the fibula, for a distance of two inches up the shaft, has several sinuses opening from the medullary cavity, and these are surrounded by warty *osteophytes*, a few of which are scattered about the lower end of the tibia; also the astragalus and calcis are firmly ankylosed together, and to the tibia. In consequence of the extensive inflammation which has existed, the original form is also destroyed, the bone being in some parts absorbed, and in other parts rough and corroded in appearance, with many enlarged Haversian canals interspersed. The calcis especially is covered with rugged masses of new bone, resembling *stalactite*."—(SECY.)

quiring pressure on the brachial artery to stop it. The fore-arm is swollen, and covering the lower third anteriorly is a swelling, which pulsates sensibly. The disease has been about two years in progress. The boy's general health is not very good; from confinement, and loss of blood, he is thin and exsanguine. The thorax is healthy. He was ordered to take a tea spoonful of cod-liver oil three times a day; pressure to be applied to the humeral artery so as to diminish, without arresting, the current of blood."

12*th*.—" Passed a restless night, in consequence of the pain caused by the pressure; the assistant was obliged to remove it.

13*th*.—" Hæmorrhage came on early this morning; the humeral artery was compressed, and a bandage applied to the limb.

30*th*.—" Nothing of consequence occurred up to this time; the boy's health has improved a good deal. This morning hæmorrhage again came on, and it was found necessary to tie the humeral artery. Amputation had been thought of, but as the disease appeared to be altogether aneurismal, delegation of the artery was preferred."

" The artery was tied in the upper third of arm, by making an incision along the inner border of the coraco-brachialis muscle, through the skin; the fascia was divided to the same extent; this brought several of the nerves into view, which were held aside, and the sheath of the vessel being opened the artery was separated from its viens, and tied. After the operation pulsation ceased in the aneurismal swelling, and the hand was reduced somewhat in size. The wound was dressed, and the hand and fore-arm bandaged."

The patient went on well for the first two or three days, but on the 4th May pneumonia set in, and he died on the 6th. Upon a *post-mortem* examination the left lung was the chief seat of inflammation, and the ordinary appearances were found. " The veins of the affected limb were much enlarged, and the inner coat of the artery was inflamed above the ligature as far as the subclavian. The hand when cut into had the appearance of erectile tissue. There was a true aneurism of the radial artery at its lower third. The coats of the ulnar artery at the lower part of the arm were dilated and thickened."

No. 20.

Extracts from the Annual Report of the Civil Station of Rutnagherry.

By E. DeCrespigny, Esq., Assistant Surgeon.

Presented by the Medical Board.

No. 1.—*Case of Poisoning by Nux Vomica.*

" A Mahratta, admitted at noon of the 31st December 1853, said he had taken an over-dose of nux vomica, viz. four seeds, each weighing 3 grains powdered, in

order to cure an ulcer on the back; complained of giddiness, trembling of the limbs, and spasms; has not vomited, nor is there any inclination; pulse natural, skin warm, pupils natural; walks with difficulty owing to a catching or spasm of the muscles; hands and fingers tremulous. A scruple of sulphate of zinc was given, but without effect; a second dose also produced no vomiting; it was swallowed with difficulty, owing to spasm. Two pints of water were injected into the stomach, and a feather passed into the fauces without avail; four pints of luke-warm water were then thrown into the stomach, which produced copious vomiting, and the injection was repeated in a quarter of an hour; the spasms increased in severity, and opisthotonos came on. There was temporary relief after the vomiting, but the slightest movement gave rise immediately to spasms; the senses were not affected, although the speech was very rapid. He described the spasms as commencing about the centre of the spine, and shooting up into the head. Vinegar and water was now given, and repeated every ten minutes or quarter of an hour. Soon after the second dose a strong purgative enema was administered, and repeated, without effect. It was not until the third enema had been given that the bowels were relieved, when he began to feel easier, and the spasms—shortly before almost continuous—were marked by longer intervals of accessions; the spasms continued until midnight, and were referred subsequently to the cervical region; the cramps extended upwards from the lower extremities also, and the diaphragm seemed affected. He complained at one time of a numbness of the lower extremities, but there was no loss of sensation; there was great giddiness throughout, and most excruciating shooting pains through the head. The latest effects observed were occasional twitchings of the tendons and a feeling of incipient spasms. He was discharged on the 3rd day."

No. 2.—*Case of Monstrosity: Congenital Malformation.*

In a case in which a medico-legal opinion was requested, as to abortion having been criminally procured, the child was produced, and proved to be a monster. "The forehead was covered with hair, the nasal bones large and prominent, the cartilages flat, the head small, and well developed, with much hair upon it, the fore-arms disproportionally long, and the hands large, the lower limbs dwarfish, and the feet large, and twisted inwards and upwards; the abdomen hard, and distended; the back with hair upon it. There was no anus, and the genital parts were singularly misformed. The labia majora descended on each side, and were lost in the skin of the nates; there was a small glans in the usual situation, but it was imperforate, half covered by a perfect prepuce, which terminated in a sort of scrotal membrane; under this glans an imperfect penis, and between the scrotal membranes was an apparent vaginal entrance, but extending no distance, and presenting the appearance of a slight concavity, like the bottom of a cul de sac. The fœtus was very feeble, and soon died."

No. 21.

Case of Malignant Fungous Tumour affecting the Upper Jaw: Excision of the Superior Maxillary Bone, together with a portion of the Malar. By T. B. Beatty, Esq., Civil Surgeon, Kurrachee.

Presented July 1854.

The following case exemplifies one of those constitutions which appears to be peculiarly predisposed from the very earliest age to cancerous diseases, which on the slightest exciting cause, either from a blow, or other injury, however trivial, manifests itself in the injured part, and with marked rapidity assumes all the characteristic appearances of malignancy.

A Mussulman girl, 7 years old, of sickly cachectic appearance, was admitted into hospital in consequence of disease of the left upper jaw. She stated that six months previously she had received a blow in the face from one of her playmates, upon which slight swelling and pain ensued. For four weeks after the occurrence little notice was taken of the swelling either by herself or her parents, but after that period she began to complain of severe aching pain in the cheek and side of the head, which continued unabated for many days, until at length a piece of bone half an inch in length came away through an opening in the palate, after which she experienced considerable relief. During the last three months the swelling has been rapidly increasing. She suffers constant pain, and her bodily health, which had been hitherto good, is now declining fast. Various Native remedies, mostly local, have been employed by her friends, without the least beneficial effect.

When I first saw her the cheek was enormously swollen, the skin being of a livid red color, and felt intimately attached to the subjacent tumour. To the finger the tumour itself gave a soft doughy feel, without, however, any distinct sense of fluctuation. In its centre there was an unhealthy-looking ulcer, the sinus in connection with which passed directly to the bone, which by means of a probe could be felt rough and denuded of periosteum. The slightest manipulation created excruciating pain, and pressure caused a copious discharge of thin fœtid pus to escape. The enlargement, by encroaching on the eye and nostril, had caused great disfigurement.

On examining the inside of the mouth the mucous lining of the left half of the palate appeared hypertrophied and diseased; all the teeth on that side had dropped out, and in the alveoli another sinus was observed, along which a silver probe could be passed up, and its extremity made to grate against rough and denuded bone. On carrying the point of the finger above and behind the soft palate, the left posterior nares was felt partially blocked up.

The softness and rapidity of growth, coupled with the constitutional symptoms under which the child was labouring, left little doubt that the disease was of malignant character, and that of a serious nature.

It was evident that at this advanced stage all remedial measures would prove

useless, and it only remained to make choice between abandoning all treatment and an attempt to remove the cause of irritation, which was so rapidly undermining her constitution. The latter, although under such unfavourable circumstances, was at length determined on ; at the same time the great doubtfulness of any success from the operation was fully explained to her friends, whose entreaties were most urgent for its removal. She was put on a nutritious diet and tonic medicines for some time previous, and on the 5th February the following operation was performed :—

The patient was brought under the influence of chloroform, and placed in the lap of an assistant. An incision was commenced directly in the mesial line from the margin of the upper lip towards the nostril and the ala as high as within half an inch of the inner canthus of the eye. Next the cheek was laid open from a few lines above the zygoma to the angle of the mouth, and a third at right angles to this was made along the zygomatic arch. The integument was now dissected up, and thrown over the forehead, which step of the operation was accomplished with much difficulty, in consequence of its intimate attachment to the tumour, and on examination, its natural structure appeared to have become so materially altered, and to have participated so much in the disease, that little hope of a successful termination could be entertained. The flap being raised, the extent of disease became apparent: almost the entire of the superior maxilla had become carious, the only portion of it remaining sound were the nasal process and the maxillary portion of the orbital plate. The principal object now was to preserve if possible the floor of the orbit, and having dissected off the tumour from its bony attachments it was discovered that the lower half of the malar bone alone was affected, and that consequently the orbit could be retained entire. With a sharp-pointed bistoury the lining of the hard palate was divided in the mesial line, as far back as the commencement of the soft palate, and at the further extremity of this cut another was made transversely, which terminated at the back of the last molar tooth ; then by means of a narrow straight-handled saw the alveoli and palatine plate were partially sawn through from below upwards, and the cutting forceps being applied, with one blade in the nostril, and the other in the mouth, that portion of bone included between was divided. A horizontal line was next made with a Hey's saw extending from the nasal process of the superior maxillary bone (below the floor of the orbit) to the outer margin of the malar, the forceps being again applied in this groove, and lastly to the zygomatic process ; a slight dissection with the knife completed the separation. During the operation only three vessels required ligature, viz. the facial, transverse facial, and coronary arteries. No trouble whatever was experienced from the internal maxillary. The cavity was filled with lint, and the lips of the wounds brought together by interrupted sutures; that in the mesial line was closed by means of two hare-lip needles and a figure-of-8 suture. On the following day mortification commenced in the integument, and a portion of the flap about $1\frac{1}{2}$ inch square was unavoidably lost.

During the following five days there was considerable constitutional disturbance, but at the end of that time the sphacelated portion having sloughed off, her health began to amend. She was ordered port wine 3 ozs. daily, together with jelly and sago, and took tonics.

After the lapse of a few weeks the remaining portion of the flap began to assume an unhealthy appearance. It became hard, painful, and swollen, and of a dark reddish color, and from its inner surface fungoid growths were observed growing in abundance. These increased with amazing rapidity, and the child's health quickly gave way; at the same time two or three glands in the neck became enlarged and painful. Any further interference being considered unadvisable, she was allowed to return to her village, which being distant some fifty miles, her future history became lost; but judging from the weakened state of her health, and the rapid progress which the disease was making when she left, it was not considered possible she could survive many weeks.

No. 22.

Case of Convulsions: Cæsarean Operation. By Assistant Surgeon M. S. Todd, H. M.'s 86th Regiment.

Presented by the Deputy Inspector General of H. M.'s Hospitals.

Mrs. C., a married woman, aged 28, of delicate constitution, was admitted into hospital on the morning of the 27th of January 1852, under the following circumstances:—

During the night she had been suffering from spasmodic pains in the lumbar region, and down the thighs, which she attributed to labour pains, as she was at that time in the last month of pregnancy. Towards morning, however, she was attacked with violent lancinating pains in the head; which increased to such a degree as to become quite alarming. I saw her about ten minutes after 4 o'clock: she was then tossing about her head in great agony, the severity of the pains occurring in paroxysms, and being such as to cause her frequently to cry out, in the most distressing manner "Oh! my head, my head!" These symptoms were attended by considerable febrile excitement, and a small rapid pulse; during this stage she was perfectly sensible. Shortly after she complained of a peculiar noise in her ears, as if a number of pebbles were rolling about in them. This was quickly followed by deafness, difficulty of articulation, and blindness. Violent convulsions now ensued, attended by complete insensibility, and these were in their turn succeeded by stertorous breathing, frothing at the mouth, violent palpitation of the heart, exceedingly rapid pulse (at first full and bounding, but soon becoming very wirey, and so rapid as not to be counted), coma, and death, which took place at 8 o'clock on the same morning.

Prior to dissolution, it was ascertained that the child was living, and consequently the Cæsarean operation was determined on, and performed by Mr. Thom, the Surgeon of the Regiment, just as the pulse became imperceptible at the wrist. A fine boy was thus born, and its position in the womb was found to be perfectly natural. There were no signs of labour during the attack. She was the mother of four children. With the two last the labours were very tedious, the children being "still-born," but with the two former they were easy and natural.

Autopsy.—On examining the head after death the structure of the dura mater and pia mater appeared healthy, and the substance of the brain itself was of the natural consistence, nor did the lateral ventricles contain an unusual quantity of fluid, or the vessels appear overloaded, but the arachnoid membrane was much thickened, and rendered opaque. Its outer surface was coated with a thick layer of coagulable lymph; whilst at the base of the brain, between the membrane and the dura mater, especially at the right side of the organ, there was considerable quantity of effused serum, in which was floating numerous flakes of lymph. The treatment adopted in this case was the same as that usually employed in cases of convulsions occurring during parturition, at least so far as purgative enemata and general and local bleeding went. No medicine was given internally, as the patient from the time of her admission into hospital was unable to swallow.

Remarks.—From the *post-mortem* appearances in this case it would seem that the arachnoid membrane of the brain was the one primarily, if not indeed the only one affected. Of this latter point I speak hesitatingly, as many eminent physicians have denied the existence of inflammation of this membrane uncomplicated with inflammation of one or other of the remaining membranes of that organ. That it was the one primarily affected, I feel satisfied, and for the following reasons:—1*st.* On account of the idiopathic nature of the disease, inflammation of the dura mater is rarely, if ever, of an idiopathic kind; and when it does occur without being the result of external injury, the inflammation is mostly of a secondary character. Dr. Abercrombie, indeed, mentions one instance where it occurred as a primary and at the same time an idiopathic affection, but the *post-mortem* appearances in his case render it doubtful that the disease did not first commence in the arachnoid membrane. 2*nd.* Because the dura mater after death presented no signs of inflammation, whereas the free surface of the arachnoid was coated with lymph, and the membrane itself thickened, and rendered opaque. 3*rd.* Had the pia mater participated in the inflammation, delirium would most probably have been one of the symptoms prior to the convulsions and coma, in consequence of its close connection with the convolutions of the brain itself; and in all likelihood the appearances after death would have exhibited the existence of adhesions between it and the arachnoid membrane, and certainly the pia mater would have been found highly vascular.

So far, then, we are led to believe that the primary affection was seated in the arachnoid membrane, and I should be inclined to think that it was the only one involved in the disease, were it not for cases on record where the dura mater was the original seat of disease; the result of external injury, although the most extensive inflammation showed itself in the arachnoid, and for one case in particular quoted by Dr. Watson, of London, in which the dura mater, though it was the

membrane injured, yet presented no further signs of disease than where the trepanning was performed. Still, however, I must confess that I do not see why the arachnoid can become inflamed without affecting the substance of the brain itself, considering that its blood-vessels enter the cerebral mass, and its nerves go out of it; while, on the other hand, it cannot be so affected without involving either the dura mater or pia mater, but more particularly the former; for it must be borne in mind that it is a fact long established, that the serous membrane of the dura mater is a totally distinct one from the arachnoid. But another argument in favor of the existence of uncombined acute arachnitis is the circumstance that the endocardium of the heart may be affected without involving the pericardium. Now this last named membrane is in every respect similar in its structure to the dura mater: it has an external fibrous layer, and an internal serous layer, distinct from the serous lining membrane of the heart called the "endocardium." If this endocardium can be diseased, as is the case in valvular affections of the heart, without affecting the pericardium, why may not the arachnoid membrane of the brain be the seat of disease without involving the dura mater? And certainly with regard to this case, the fact of the remarkable absence of inflammation either in the dura mater or pia mater is confirmatory of this view.

We will now inquire into the cause of this inflammation. This patient had been for some years much subject to rheumatic affection, chiefly exhibited by febrile excitement, accompanied by pains and swellings of the large joints, especially the knees and ankles, into the synovial membrane of the former of which a considerable quantity of serum had been at one time effused, whilst at another time the affection assumed the character of rheumatic gout, attacking the small joints of the fingers. Coupled with this, she was a woman who presented in a marked degree many of the characteristics of the rheumatic diathesis, and her husband informed me that for some time previous to this attack she had been in bad health, her nutritive functions having become much impaired.

From the history of her case I think we may fairly conclude that the disease had a rheumatic origin, and more especially so when we consider this circumstance, viz. that from the time of her last conception she had not had a rheumatic paroxysm.

Rheumatism is a disease affecting chiefly the fibrous tissues, but instances are not wanting where the synovial and serous membranes become its seat—membranes much resembling each other in their general characters, and in their minute structure essentially alike; and of all the internal parts liable to this affection, the pericardium, a fibro serous membrane, appears to be most susceptible of its influence. But we find that in the majority of cases, when the disease attacks the pericardium, it is of a secondary nature, having primarily existed in the large joints and other external parts, and that it has been removed from them to this membrane by a species of metastasis. On the other hand, however, we find that where the rheumatic diathesis developes itself primarily in the membranes of the heart, the endocardium is the chief seat of the disease; in confirmation of which, I would refer to several cases published by my brother Dr. Todd, of London, in his essays on Gout and Rheumatism.

The peculiarity in the morbid phenomena of these two membranes bears a

striking analogy to those already mentioned with respect to the dura mater and arachnoid, as far as their predisposition to disease goes; as regards their primary and secondary natures, and considering that when the endocardium is affected with the rheumatic diathesis, the disease produced is of an adhesive inflammatory kind, I think we may conclude that under certain predisposed states of the system, in the arachnoid membrane, of the same structure as it, and therefore liable to the same morbid phenomena, the rheumatic diathesis may be developed primarily by inflammation of that membrane, instead of in its usual seat, the endocardium.

That there was this predisposed state of the system in the case before us, I think is evident.

It will be remembered that the constitution of this patient was such as to present many of the characteristics of the rheumatic diathesis; that she was in the ninth month of pregnancy, and that prior to her last conception she had frequent rheumatic attacks, but that since her conception she had not had a rheumatic paroxysm.

Now, in the first instance, we find that the uterine excitement consequent upon pregnancy produces a sympathetic irritation of the nervous system, at times so severe as to cause violent convulsions, and lead to fatal results. Again, it was remarked before, that this woman, prior to this attack, had been in bad health, her nutritive functions being much impaired; and it has been observed that in this low state of the system existing in a case combined with the rheumatic diathesis, the nervous system is rendered highly susceptible of the least stimulus. Hence we may, I think, with justice conclude that these two exciting causes, so eminently displayed in this case, induced the development of the rheumatic diathesis in the arachnoid membrane of the brain, by producing inflammation of it; when the probability is in the less excited state of the nervous system the disease would have had its seat in the *endocardium* of the heart.

No. 23.

Two Cases of Snake-bites. By T. M. Lownds, M. D., Assistant Surgeon.

Presented July 1853.

Both cases happened in Scinde, the first in June 1852, to a Scindee living some fourteen or sixteen miles from Hydrabad, and who was not brought into the Civil Hospital until twelve hours after having been bitten. The kind of snake was not known.

He stated that he had been bitten about 5 o'clock the previous evening on the foot, and that he had taken some medicine—a supposed specific; that he began to spit blood about three or four hours afterwards, and that this blood-spitting had continued ever since. In person he was powerful and well developed. A bandage had been tightly applied below the knee.

Symptoms.—Two small punctured wounds were distinctly visible, a short distance apart, a little anterior and inferior to the internal malleolus of the right foot. No bleeding from the wounds. Coughed a good deal, and by this coughing brought up a considerable quantity of blood, which seemed to have no tendency to coagulate. Breathing natural, except when blood again accumulated in the air passages, and caused coughing. Pulse about 90, and full. Expression of countenance haggard and anxious. He distinctly stated that he felt no pain whatever.

Treatment.—I united the two punctured wounds by an incision, and placed a small cupping-glass over the incision. This drew a little blood, but not much; still no tendency to coagulation. I ordered stimulants of sulphuric ether and spiritus ammoniæ aromatici to be administered in full doses, if any change took place in the character of the pulse, or he should appear weaker. At this time, about 5-30 A. M., the patient refused to take any medicine. At 1 P. M. the pulse had become much weaker, and the medicines ordered were attempted to be given, but he still obstinately refused to take them. Spitting of blood still continued; he gradually became weaker and weaker, still refusing anything and everything; and he swooned and died at 5 P. M., or about twenty-four hours after having been bitten.

The second case happened to a sepoy, who was bitten by a snake on the 18th August, said by the natives to be of the cobra species. He came to hospital about 5-30 or 6 A. M. next day.

General appearance.—Slight, but well made; aged about 25 years.

Symptoms.—There are marks of the fangs of a snake a little anterior and inferior to the internal malleolus of the right ankle; wounds do not bleed at all, nor has any application been used, a ligature only having been tied round the leg a little above the ankle; countenance natural, and at this time no appearance of anxiety. No pain anywhere, except a slight pricking in the wound itself; blood-spitting had commenced about three or four hours after the bite, and still continued. This was the only abnormal symptom. His pulse natural, and breathing regular. The blood that was spat up had no tendency to coagulate, and exactly resembled that mentioned in the former case.

Treatment.—I made several small incisions, one to connect the two fang-wounds, and one on either side, where there appeared some slight laceration. A cupping-glass was exhausted, and placed over the wound. It was soon half-filled with blood, without tendency to coagulation. This had scarcely been done when I was requested by the Officer commanding the regiment to allow two sepoys (who said they could cure snake-bite) to try their remedies. I at once consented, and merely applied caustic to stop the bleeding. They put on a poultice composed of some jungle leaves over the wound, and gave the patient a dose of croton oil seeds, which produced considerable vomiting and much purging. At 6 P. M. I found the spitting of blood still continued; countenance expressed some anxiety; pulse about

96, full in strength; bleeding had recommenced from cuts in foot, probably to the extent of 6 or 7 ounces; still the same sort of blood. At 2 A. M., being hastily summoned, I found that about half an hour before the patient had become almost suddenly insensible, extremities cold, and corpse-like; no pulsation could be felt at the wrist, nor could the beating of the heart be distinguished. Wounds in foot still continue bleeding, but not very much; spitting of blood had not occurred for about two hours before insensibility came on. Stimulants of ammonia, arrack, and chloroform were given; enemas of mustard and water with ammoniated tincture of valerian administered, and mustard poultices and frictions externally. He gradually recovered from the collapse, and the blood-spitting did not return. He remained in hospital until the wounds healed; then discharged, quite well.

Observations.—With reference to the incisions and the application of cupping-glasses, they were rather done to inspire confidence than with a hope that any portion of the poison would be extracted so long a time after the bites occurred, and it was thought better to wait for some more decided symptoms in regard to the state of the system, than to administer any medicine without a special object in view.

The similarity of the two cases is remarkable. Blood-spitting at first was the only prominent symptom supervening in each case, and at almost the same time. The blood was non-coagulable in both. The sinking in the heart's action commenced at similar periods, and the insensibility almost at the same. The state of the blood may lead to the conclusion that death threatened by syncope rather than by asphyxia. Whether this poisoned or deteriorated blood acted on the great nervous centres, and thus through the medium of the brain induced failure of the heart's action, or directly by depressing the nervous and muscular energy of the heart and great vessels, are points to be determined. In neither of these cases did the disposition to sleep, which is so commonly remarked, occur.

No. 24.

On Vaccination; being Extracts from a Paper read before the Grant College Medical Society. By Mr. Atmaram Pandoorung, Graduate of the College.

Presented by the Grant College Medical Society.

The author, after alluding to the ravages of small-pox in Bombay, and to the number of deaths which are yearly exhibited from that disease in the published Mortuary Returns of the Island, says—"The subject of vaccination may be very

conveniently discussed under the following heads:—1*st.*—Is the practice of vaccination generally known to exist? 2*nd.*—Do people (Natives) understand its object? 3*rd.*—What are the causes of neglect of vaccination? 4*th.*—What are the best means of extending its benefits?"

Under the first two heads the author adduces instances of the practice of vaccination being confounded with that of inoculation, and says that amongst "all classes" of Natives the distinction is not sufficiently recognized, and that the want of success of inoculation is ascribed to vaccination. "Instances of death in the former practice (inoculation) are not very uncommon, and when one occurs, rumours are circulated, with the color of falsehood, much to the prejudice of both, especially of the practice of vaccination." Again, the writer says there is a belief amongst the ignorant, "that it is a certain deity that sends the disease (small-pox) in a mild or severe form as a punishment for sin, and that it would be offering the deity an offence to interfere with his will by any process of art which human ingenuity might devise."

It apears that inoculation is practiced in the Concan and Deccan, under the name of "the *potter's* process," but not to any great extent in Bombay.

"It consists in scarifying deeply in one or two places, and then applying to the parts matter or crusts removed from the eruption of small-pox." The practice of vaccination is called, in contra-distinction to the *potter's* process, "the *Government* process"; and the writer is of opinion where the latter is known "that it is believed to possess the property of affording security from small-pox," but that it is not depended upon; that failures are magnified, and that the conviction of its power and advantage is not so strong in the minds of most of the lower classes of Natives as to induce them to resort to it.

Under the 3rd head, or causes of neglect of vaccination, one of the chief the author considers "is want of sufficient information on the subject"; but he says there are several secondary causes extensively in operation, particularly amongst the middle class of Hindoos, who are accustomed to expend large sums of money in celebrating the day upon which their children are either inoculated or vaccinated, and who are deterred from the practice in many instances on account of the customary and necessary attendant expense. Mere "prejudice," the writer thinks, is confined only to "the most illiterate of the lower classes."

As to the means of extending the practice of vaccination, the author deprecates those attended by coercion, but thinks that the employment of intelligent and educated vaccinators, who at the same time might be able to give medical advice and assistance in other diseases, and thus inspire confidence in the minds of the Natives, would be most conducive to success. He thinks also benefit would arise from the circulation of tracts upon vaccination in the vernacular languages.

No. 25.

Cases of Lithotomy. By Mr. Bhawoo Dajee, Graduate of the Grant Medical College.

Presented by the Grant College Medical Society.

The first five cases of stone in the bladder were operated upon at the Nagdevi Charitable Dispensary,* Bombay; the sixth occurred in private practice.

No. 1.—A Bania boy, aged 10 years, native of Bombay, was brought to the Dispensary on the 17th November 1853. His father stated that about four years ago the boy was attacked with measles, and six months after passed blood through the urethra for three or four days. From that time difficulty of voiding urine very much increased. Has been under native treatment without relief. Up to 2 years of age opium was daily given to him. He is now somewhat emaciated, and has frequent calls to pass urine, which first escaping in a stream becomes suddenly interrupted, attended with agonizing pain. The urine also dribbles unconsciously over the clothes. He feels irritation about the prepuce, which is elongated, and points to the bulb of the urethra as the seat of uneasiness. Urine sometimes tinged with blood; pulse of tolerable strength; bowels regular.

He was sounded with a catheter, and the sensation of a stone was distinctly felt several times. From November to April he was treated with demulients, tonics, and anodynes. His urine was examined several times, and was ascertained not to be albuminous.

On the 20th April 1854, the lateral operation for lithotomy was performed, in the presence of several of the Professors and Graduates of the Grant College. The patient was brought without any difficulty under the influence of chloroform, and a staff (the largest which the urethra would admit) was introduced, and after the stone had been felt the staff was held by Dr. Ballingall. When the hands and feet were properly secured, an incision about an inch in length was made in the perineum, from the front of the anus, commencing close to the raphè, and carried downwards and backwards midway between the tuberosity of the ischium and the margin of the anus. With repeated touches of the knife, the cellular tissue and other parts were divided, and the groove of the staff being felt, the point of the knife was directed into it, and pushed into the bladder, guided along the back of the nail of the left fore-finger. The knife was removed, and the same finger being introduced, the stone was felt, and the opening in the prostrate gently dilated. Upon withdrawing the finger, the forceps was introduced, and having quickly caught hold of the stone, it was extracted gradually and without much force. It was found to be entire, and to have been seized by its shortest diameter.

* The Dispensary is situated in the centre of the Native Town. It is supported *entirely* by the voluntary and liberal contributions of one Native gentleman. It was opened in May 1853, and administers medical relief to upwards of 100 poor persons daily. It is under the immediate charge of Messrs. Bhawoo and Narrayen Dajee.—(Secy.)

A gutta-percha tube was introduced into the wound, and secured. The legs having been tied together, he was transferred to bed.

During the operation about 2 ounces of blood were lost.

The stone weighed two drachms. It was of an oval shape, somewhat flattened, of whitish color, and covered with sharp angular scales, shining in particular positions.

There was little or no fever, and no untoward symptoms followed the operation. Urine began to pass through the urethra after nine days; the wound completely healed by the 11th May, and the boy was discharged quite well on the 18th.

No. 2.—M. R., Hindoo, Lohana boy, aged 6 years, native of Kattiawar, in tolerable good health. Had all the symptoms of stone in the bladder, which were confirmed by examination with the sound. His mother stated that when a year and a half old he passed bloody urine, and that symptoms of difficult micturition then appeared, which have increased ever since. Opium was given for about six months after birth; the child was then in a sickly state. For some weeks he was under treatment, in order to lessen the irritation, and to improve the general health. On the 20th April 1854, in presence of the same spectators, and a few minutes after the first operation (Case No. 1), the patient was operated on, in the same manner, under the influence of chloroform. The operation lasted between 4 and 5 minutes, and the stone was removed without any great difficulty. On examination of the bladder with the finger, a small piece of calculus (which appears to have broken off from the large one) was felt; the bladder was consequently syringed out, and the debris removed. A gutta-percha tube was introduced, and the legs being secured he was removed to bed. There was very little blood lost.

Four days after the operation blood began to pass from the orifice of the urethra, as well as from the wound. The skin became cold, and pulse feeble. Ice-water was applied, and stimulants given. He lost about 3 or 4 ounces of blood, chiefly venous. On the 26th the bleeding was stopped, and the urine began to pass from the urethra. After this the wound healed steadily, without any bad symptom, and the boy was discharged well on 21st May.

The calculus was of the mulberry kind, of a brown color, of the size of a betel-nut, and weighed 1 drachm and 34 grains.

No. 3.—A Mahomedan boy, aged 10 years, a good deal emaciated, born in Bombay, was brought to the Dispensary several times, suffering from all the symptoms of stone in the bladder, confirmed by sounding. His father states that when four years old the boy had some difficulty in passing urine, which has continued to increase. Opium was given to him for a year and a quarter after birth.

On the 2nd of June 1854 the lateral operation was performed in a similar way as described in the two previous cases, in the presence of some of the same gentlemen. No unpleasant symptoms followed. About eleven days after the operation urine began to pass through the urethra, the wound completely healed by the end of the third week, and the boy was discharged well at the end of the fourth week.

The stone weighed 2 drachms and 25 grains. It was roundish, of the size of a nutmeg; the surface being covered with small round dark nodules, interspersed with shining crystals.

No. 4.—J. S., a Mahomedan boy, aged 4 years, was admitted into the Dispensary on the 21st of August 1854. The symptoms of stone were clearly marked. He was sounded several times, and the stone distinctly felt. The disease appears to have commenced when he was 6 months old, after an attack of small-pox. The urine was observed to be turbid, leaving a white sediment at the bottom; opium was administered to him by his parents after the commencement of the attack to relieve the pain, but it has been stopped since his admission into the Dispensary.

On the 3rd of September 1854 the lateral operation of lithotomy was performed, and two stones were extracted, weighing together 1 drachm and 4 grains. Each was of the size of a small plum, of greyish color. The wound healed steadily, and he was discharged well after a month.

No. 5.—J. V., a Bania shroff, aged 50 years, a native of Ahmedabad, resident in Bombay for the last twenty-three years, became in July 1854 a patient at the Dispensary. He was emaciated, and suffering from the symptoms indicating the presence of a stone in the bladder; the frequency to pass urine,—in an interrupted stream,—the pain in the pubes, the presence of purulent matter and blood in the urine, and the passage of urinary calculi twice before his present sickness, left no doubt as to the diagnosis. He was sounded several times, and the stone distinctly felt, and judged to be of large size.

The history of the case points to the commencement of the disease about five years ago, when he first began to feel the pain about the lower part of the pubes, which was relieved by the use of purgatives; these paroxysms of pain recurred several times in a year, but laterally they became very frequent. On the 1st September 1854, having been made insensible by chloroform, the lateral operation for lithotomy, in the manner before described, was performed. The stone being larger than usual, there was considerable difficulty in attempting to extract it through the first opening, which required to be enlarged to permit of its removal. It weighed nearly 3 ounces (troy), was of an oval form, flattish on two sides, and of a brownish white colour.

For the first two days after the operation the patient did not complain of pain, and slept pretty well, but afterwards his strength began to fail. The wound was not healthy-looking, and there was fæculent discharge of an unhealthy character passing through it. The bowels were relaxed, and he became restless. On the fifth day after the operation there was swelling observed around the wound, which increased on the sixth and seventh, and he died at 5 P. M. on the latter day.

No *post-mortem* examination was permitted by his friends.

No. 6.—S. P., a Parsee priest, aged 47, native of Bombay, considerably reduced in flesh, was under treatment for some time, complaining of uneasiness in the lumbar region, and in the pubes on the left side, increased on pressure; he suffers also from incontinence of urine, the stream becoming suddenly stopped, and the urine escaping in drops, slowly and with difficulty, causing increased uneasiness in the loins and pubes. A stone in the bladder was felt distinctly by the sound upon several occasions. On the 30th November 1854 he was rendered insensible without difficulty by chloroform, the lateral operation was performed in the manner already described, and a stone extracted, weighing one drachm. He continued very well till

the fifth day, when at 11 in the morning there was suddenly hæmorrhage to the extent of about 10 ounces, chiefly venous, and he became collapsed. The pelvis was well raised, ice applied over the pubes, and stimulants given. The hæmorrhage was checked in about four hours. He slowly got better, and the wound completely healed in about seven weeks. He is now considerably improved in health, and is perfectly free from the urinary disease.

No. 26.

A Case of Twins, in which the Birth of the second Child was obstructed by the protrusion of a Hand by the side of the Head. By Mr. Atmaram Pandoorung, Graduate of the Grant Medical College.

Presented by the Grant College Medical Society.

Early in the morning of the 2nd of March 1853 I was called to see a Mahratta woman in her fifth labour, residing in Girgaum. She was about 28 years of age, of rather spare constitution. I found her sitting on the floor, with her legs stretched out. She was supported in this position by an attendant sitting behind. Before her lay a full-grown newly-born child. It was wrapped up in a piece of cloth, and was not separated from the placenta, which was still within the uterus. A midwife in attendance stated that there was another child in the womb, but that the pains being feeble, it could not be delivered, and hinted that some medicines were required to excite effective pains. The size of the abdomen was such as to indicate the possibility of there being a second child. I proposed that first of all the infant already born should be separated; but the idea was quite opposed to the usual mode of procedure of the people of this country in such cases, and associated in their minds with some degree of horror, from a strange belief that if the cord is cut before the placenta comes away, that then the placenta passes high up, and out of reach, and causes the death of the mother. They would not therefore at first consent, but after some explanation of its necessity, and being assured that it was unattended with the least danger, either to the mother or the child, they agreed. I separated the child after putting two ligatures on the cord, and gave it in the charge of a nurse. I then at once proceeded to make an examination per vaginam, without any opposition. (I have very often found that such an examination made at once, and without asking in the first instance the consent of the patient, is seldom offered any opposition to, but, on the contrary, to propose, and then to wait till consent is given, generally fails.) I passed my hand slowly upwards in the direction

of the vagina, and detected a hand, hanging in the centre of the pelvic cavity. On tracing it upwards, I found the head resting upon the brim of the pelvis. I passed my fingers all round the presenting part of the head, and found the fingers of the other hand of the child lying on the side of the head, just opposite to that part of it along which the protruded hand had passed. At first I thought it was a case of arm-presentation, in which turning would be necessary, and accordingly began to search for the feet, but the uterus, having been drained of its liquor amnii, was pretty firmly contracted upon the body of the child, and consequently my attempts at finding the feet failed. I found, however, that it was very easy to put the protruded hand above the head, that is, towards the chest, and thus remove the only obstruction there was for the passage of the head, and the safe delivery of the child; but a vivid recollection of Dr. Rigby's recommendation that "the prolapsed arm is not to be put back" made me hesitate before I ventured to have recourse to such a proceeding; for though simple, I believed it was one of my own invention. I paused to reflect that if I could, by a very simple method of putting the protruded arm back, make it a common case of natural labour, there could indeed be no grave objection to the plan. At all events, I thought of doing so, and sat by the side of the patient watching if any progress in the labour was made otherwise. Such not being the case, I therefore after some time returned the prolapsed hand, and made a little screw-like motion of the head, to adapt its long diameter more accurately to that of the pelvic cavity, and thus to allow no space for the return of the hand back again. The labour pains immediately began to increase, and the head in consequence to make progress. But it was slow, and I had to wait for about three hours, when, after giving her a dose of 20 minims of the ethereal solution of ergot, a living healthy child was born, and the two placentæ came away of themselves quite naturally.

No. 27.

Cases of Caries of the Bones. By Mr. J. C. Lisboa, Graduate of the Grant Medical College.

Presented by the Grant College Medical Society.

No. 1.—*Of the Bones of the Cranium.*

R. G., aged 35, a Hindoo beggar, native of Nassick, was admitted into the Jamsetjee Jejeebhoy Hospital on the 13th October 1851, suffering from symptoms of primary and secondary syphilis, for about one year. On admission

there was an ulcer on the glans, and some eruption of the skin. Some time after he complained of severe headache, became comatose, and died on the 3rd of November 1851.

Post-mortem examination eight hours after death. The scalp was closely adherent to the bones of the cranium by deposition of yellow-colored lymph, apparently of recent date. The dura mater was also adherent pretty firmly to the cranium by similar deposit of yellow matter in scattered masses, in some of which ossification had commenced to take place. The cranial bones were soft, and easily broken, and they presented numerous elevations and depressions, some of the latter penetrating quite through the tables of the bones, and leaving large apertures here and there. The elevations were in some places of yellow color, and rather soft, admitting of being cut with some ease by means of a knife. Opposite to the depressions on the cranial bones the external surface of the dura mater presented a thicker mass of the yellow deposit, thus giving it, when detached from the bones, an irregular appearance. The other two membranes were healthy.

Brain.—The crura cerebri, together with the structures enclosed in the inter-peduncular space, were found softened, being easily reduced to a pulpy matter. The softening had extended upwards to the gray matter surrounding the third ventricle and to the fornix. The latter had sunk into the cavity of the ventricle. The rest of the brain and all the other contents of the cranium were healthy.

Chest.—All the viscera of this cavity were healthy.

Abdomen.—The liver was adherent to the diaphragm, to the stomach, and to the anterior parieties of the abdomen by means of old adhesions, but its structure was healthy. The spleen was also adherent by several bands of cellular tissue to the parieties of the abdomen, but healthy in its structure. Kidneys—left: the cortical portion was enlarged, and encroached much upon the tubular, the latter having disappeared to a considerable extent. The right was healthy. The other viscera were not examined.

No. 2.—*Of the Bones of the Right Foot.*

A Hindoo grass-seller, aged 35, a native of Rutnagherry, was admitted into the Jamsetjee Jejeebhoy Hospital on the 3rd of July 1851.

The right foot is swollen to double its natural size. The swelling is in places soft and elastic (chiefly over the malleolus), in others it is hard and tumid. The toes appear shortened, as if imbedded in the swelling. The skin of the foot is tense, shining, and somewhat discolored. There are numerous small openings situated over elevated bases, through which a thin sanious discharge oozes. Severe darting pain, deeply seated, and coming on in paroxysms, is complained of. No grating sensation is felt on moving the metatarso-phalangeal articulations, but there is some on moving the ankle-joint.

States that about three years ago the sole of his foot was pierced by a thorn, where an abscess appeared, and burst in about a month, when the swelling subsided, and the part returned to its natural condition. That two months afterwards, whilst proceeding on foot to his native place, the sole of the right foot again became swollen and suppurated, and matter was discharged through several small openings, which continued without healing for some time. For this he was salivated.

Since that time, now about a year and a half ago, the swelling has been gradually increasing. He is much reduced. General health impaired ; suffers from evening febrile accessions, terminating by profuse sweating during the nights.

On the 5th June amputation of the leg was proposed, but not consented to, and he left the hospital at his own request. He was re-admitted on the 4th September, considerably reduced in flesh, but the foot remained in the same condition. On the 6th September amputation below the knee was performed, and he bore the operation well. The greater part of the stump healed by the first intention.

The amputated limb was subjected to maceration, and it presented the following appearances :—The whole foot is in a carious state, the caries affecting the bones of the tarsus and metatarsus. Inflammatory action seems to have extended up the leg, and, as a result of it, irregular ossific deposits have taken place on the tibia and fibula.

It does not appear from the history of the case that the man suffered from syphilis, or manifested any symptoms of scrofula. Amputation in this case was a necessary measure, on account of the severe hectic symptoms, caused by extensive local disease. He left the hospital in December 1851, in very good health.

No. 28.

On the Native Practice of Midwifery ; being Extracts from a Paper read before the Grant College Medical Society. By Mr. Burjorjee Dorabjee, Graduate of the Grant Medical College.

Presented by the Grant College Medical Society.

After alluding to the ignorance and self-confidence of Native midwives, the writer says :—"They pretend to diagnose the existence of pregnancy so early as the 5th or 6th week. This they do, after some questions regarding the last appearance of menstruation, by proceeding to examine the abdomen (the stomach and bladder being empty) 'before the sun is pretty high.' They feel for a certain body called 'ganth' (ગાંઠ), which they believe to exist just below the umbilicus, and they attach great importance to whether it is situated in its natural position or not." Soon after conception they suppose it goes to one side or the other, where it is held fast by the fœtus, and maintained in its position. "Its small size, they say, determines the early age of the fœtus, and when they cannot find it, they think that abortion is threatened."

The author suggests that the probable origin of this popular error may have been the detection of an enlarged ovary or ovaries in some cases of pregnancy.

"After five months they are guided by the size of the abdomen and movements of the child, although they often mistake flatus for the latter. This circumstance they are aware of, and therefore prescribe some aromatics and carminatives to be taken two or three mornings before the examination."

When upon feeling some movements in the abdomen, and expressing a decided opinion as to the existence of pregnancy, should such not be the case, and the woman passes the ordinary time, they still maintain that their views were correct, and add "that the menses are all coagulated round the fœtus, in consequence of its not being able to suck up the discharge."

Towards the close of pregnancy, if the expected time of delivery is thought to have been passed, they manipulate the abdomen "by pressing with their four fingers of both hands, commencing over the fundus of the uterus, passing down the sides till they reach the groins; and this they repeat several times, with the view, as they say, that the child may not be quiet for many more days or weeks." They then pass two fingers into the vagina, and say how many days are still wanting for delivery."

With respect to delivery, the author thinks that the premonitory pains of labour are often mistaken for attacks of colic, flatulence, &c., as upon their occurrence carminatives and cordials are generally given.

The midwife in attendance usually examines the state of the os uteri at an early period of labor, and until it is fully open, encourages the female to patience in her sufferings, and to look forward with confidence to a favourable result. When the os is dilated, the patient is urged to walk about, "to hold her breath, and make forcible efforts at expulsion."

"The obstetric position" is generally determined by the elders of the household, according to the practice of their families, but it is more commonly either squatting upon the ground, or upon the edges of two chairs, or sitting across a "thick pillow filled with saw-dust."

The writer alludes next to the injurious consequences likely to follow the forced expulsive efforts both to the mother and child, such as exhaustion and syncope to the former and death to the latter, results not unfrequently witnessed.

"During the passage of the head through the dilated os, the midwives put both fore-fingers into the vagina, and pass them between the head and the os, with the view, they say, to facilitate expulsion, and they do the same during the passage of the head through the os externum."

They do not support the perineum, and would object to it on the ground of its retarding the progress of the labor. "When the head has passed, the midwife puts her finger into the axilla of the child, and pulls out the shoulder, and quickly after that the body."

A binder is used after delivery "to avoid producing a flaccid belly." The detachment and expulsion of the placenta is anxiously sought for, as the cord is not divided until the after-birth comes away. The patient is removed very quickly to bed, and the vagina washed with spirit and water. Afterwards, various aromatics and astringents, made into a sort of paste with oil, and enclosed in a linen bag, the size of a hen's egg, are introduced into the vagina, and a compress and bandage applied. This is repeated every three or four days. Before the cord

is divided, the blood in it is either pressed in the direction of the placenta, or of the child, depending upon whether the child is lively or otherwise. If the latter, the blood is forced towards the child. After cutting the umbilical cord, it is dressed with salt and turmeric, and suspended from the neck; and the child is not again bathed until the cord falls off.

No. 29.

Case of Poisoning by Gamboge; from a Paper read before the Grant College Medical Society. By Mr. Ardaseer Jamsetjee, Graduate of the Grant Medical College.

Presented July 1854.

At 8 o'clock A. M. of the 27th February 1852 a delicate Parsee female, aged 19, took about 3 drachms of "pipe gamboge" (value 3 pie) for the purpose (she confessed afterwards) of self-destruction, and by this means to terminate some family disturbance. When seen, five hours afterwards, she was collapsed from the violent vomiting and purging which was brought on, and which commenced about two hours after taking the drug. The matters passed were of a deep yellow color, and the pain and suffering very great; stimulants were given, and frictions employed, and the collapse passed off; but the evacuations continued frequent, with straining and griping, and were chiefly of yellow mucous for some days after. For this she was appropriately treated, and slowly recovered.

No. 30.

Case of Tetanus, following Abortion; being Extracts from a Paper read before the Grant College Medical Society. By Mr. Bazunjee Dossabhoy, Graduate of the Grant Medical College.

Presented July 1854.

Early on the morning of the 24th April 1853 a Parsee female, aged 26, mother of four children, (the youngest a year and half old,) in the third month of

pregnancy, after suffering for several hours during the night from uterine pains, had hæmorrhage come on. The os uteri, on examination, was found to be "dilated a very little." She was treated by dilute sulphuric acid and opium, with cold applications, &c., but the pains and discharge continued throughout the day, and at 6 P. M. an embryo was expelled, but which was not preserved. The pains then entirely ceased, and the hæmorrhage merged into the ordinary sanious discharge, which continued for the next day or two.

On the 30th "difficulty in opening the jaws to the full extent" was complained of, but there were no other symptoms of tetanus, until the 5th May, when "the abdomen was somewhat hard and tympanitic. No stiffness of any other muscles except those of the jaws." The pulse continued at 100, small, and compressible. She remained in this state to the 17th, when "spasmodic contraction of the muscles of the back and lower extremities" came on, and there was "increased stiffness of the muscles of the neck and abdomen." The pulse was now 112, of the same character as before.

She was treated by hemp, quinine, and generous diet, and recovered by the middle of June; menstruation having occurred at the usual period, but rather profusely.

No. 31.

Case of partial Hypertrophy of the Scrotum, attended with a peculiar Eruption and Discharge. By Mr. ARDASEER JAMSETJEE, Graduate of the Grant Medical College.

Presented July 1854.

A Parsee merchant, of stout habit, and 50 years of age, in falling from a height some 18 years before, injured the perineum. Six months afterwards an eruption appeared on the scrotum, which has continued ever since, along with a gradual increase in size of the part, for which he has undergone a variety of treatment. In June 1853 he presented the following appearance:—

"There is a copious eruption of vesicles, varying in size from a pin's head to a grain of gram seed, chiefly at the upper and anterior part of the scrotum, where the integument is rough and thick. From the vesicles a white milky fluid exudes to the extent of a few drachms in the course of the twenty-four hours, but sometimes several ounces (8 or 10) are discharged. The fluid spontaneously coagulates on standing, and separates into a homogeneous and liquid portion; the latter dissolving

in sulphuric æther. It presents no particular appearance under the microscope, except a few oil globules in the fluid portion. The discharge does not appear every day; sometimes a week or more passes without any vesicles bursting. Often, however, they are burst by scratching the part, to relieve the intolerable itching which is present. When the milky fluid has been discharged, the vesicles subside, and assume the character of fleshy tubercles. The patient does not suffer from any organic disease, and the general health is not much affected."

He was treated with tonics, iodide of potassium, &c. Ice-water, iodine, collodion, and various stimulating lotions were applied to the part. On the 1st September, the date of the last report, there was little or no change in any respect.

"This case is interesting, as it may be reasonably inferred, that in consequence of the milky discharge the hypertrophy of the scrotum does not increase. A process of nature is thus set up to prevent its further enlargement, which would doubtless happen were the fibrine and fat not thus from time to time thrown off."

No. 32.

Case of Carbuncle, involving in its progress the Destruction of very important parts. By Mr. Narayen Dajee, Graduate of the Grant Medical College.

Presented July 1854.

A Parsee, aged 60 years, on the 18th December 1852, consulted me on account of a swelling, of the size of an orange, situated on the left side of the face, which extended from the zigoma downwards to within two inches of the left clavicle. It commenced about fifteen days ago, as a small swelling behind the ear, and has rapidly increased. It is most prominent opposite the lower jaw, is of general firmness, but boggy in places, and not very painful. No blood vessels ramify over its surface. There is no enlargement on the inner side of the cheek. The tonsils and palatine arches appear to be pressed inwards. The mouth is always open to a small extent. There is difficulty in swallowing liquids, and a portion of them returns through the nostrils. His health is indifferent. He suffers from fever, and the pulse is frequent and feeble.

A straight incision, about an inch and a half in length, was made into the swelling. A small quantity of thick matter mixed with blood escaped. A poultice was applied, and three grains of quinine ordered three times a day. Good diet.

19*th*.—There is a thick white discharge from the opening, which has a peculiar, but not fœtid smell. Has some fever.

20*th.*—The bottom of the wound is covered with sloughs. The discharge is free. To be dressed with turpentine liniment.

21*st.*—The discharge has somewhat increased; the sloughs are in places separating. The skin around the wound for about an inch in extent is gangrenous. The incision is lengthened over the part. Continue.

23*rd.*—The discharge is copious, white, and mixed with shreds of areolar tissue. The wound is extending. He has no sleep, and becomes daily more emaciated. Morphia at bed time, and continue the other medicines.

28*th.*—The sloughing has proceeded backwards. Pulse small, and easily compressed. The medicines continued.

29*th.*—The wound is in places covered with granulations; thick matter oozes out from the wound on pressure at the upper part of the swelling.

30*th.*—The slough is still extending deeply; a portion of the digastric muscle and some nerves (branches of the vagus) are observed to cross the wound. These nerves, when touched, do not give rise to any pain or muscular movements; but when the sloughed areolar tissue is removed, he feels acute pain. There is obstruction in the throat on swallowing, and the left palatine arches are felt more bulging inwards.

2*nd January* 1853.—On examining the wound a small opening is observed on the side of the pharynx, through which portions of liquid food pass out from the mouth into the wound. The discharge continues of the same character; the wound is in places granulating.

4*th.*—Has much difficulty in taking food, as the greater part escapes through the opening into the wound. The pain and tenderness around the swelling continue. Conjee and soup are administered by the stomach-pump.

5*th.*—The skin on the left side of the neck, and that over the trachea, is considerably undermined, and forms a flap covering the dead structures. The wound is now the size of the palm of a hand, and its bottom forms a large cavity. The liquids that are taken escape through the opening of the pharynx into the wound, and raise up the flap of skin. The masseter muscle is covered with granulations, while higher up the swelling is soft, and not so prominent as before; and on pressure matter oozes out.

10*th.*—The sloughs at the lower part are almost separated. The omohyoid, the digastric, and the sterno-mastoid muscles, are exposed, as well as some branches of the par vagum, which run longitudinally over the scaleni muscles, but the jugular vein and the carotid artery are not visible. The pulsation of the subclavian artery is distinctly perceptible at the lower part of the neck. Food is introduced by the stomach-pump two or three times in twenty-four hours; breathing is difficult; he has occasional cough, and there are bronchitic râles over the chest.

11*th.*—The sloughing of the skin extends posteriorly; the discharge is copious; the fibres of the sterno-mastoid are uncovered.

12*th.*—Is feebler. He has occasionally hiccup; he is still fed by the stomach-pump, and the medicines are continued.

15*th.*—Does not allow the stomach-pump to be introduced. The discharge is copious, breathing slow; cough troublesome. Has fever and delirium at night.

16*th.*—Is fast losing flesh. The surface of the carbuncle presents a pale

appearance. Passes stools in bed. Is delirious, and breathing oppressed. Died at 6 A. M. on the following morning.

Remarks.—The process of sloughing in this case was very extensive, and led to the destruction of important parts. The discharge was of a white colour, of a peculiar smell, though not fœtid. The carotid artery and the jugular vein were not to be seen in the large chasm that was formed after the sloughing had gone deep. Hence it would appear that these blood-vessels were clogged up by the coagulation of their blood, (as occurs in other parts,) and the cords left were discharged along with the flakes of dead areolar tissue. The dead nervous cords were distinctly seen during the removal of the areolar tissue, and where they possessed vitality acute pain was felt in touching them with the instrument.

There are certain physiological points worthy of remark. First with regard to the par vagum—a large nerve distinctly seen lying on the scaleni muscles. When it was irritated there was no sign of motion or pain ; but the breathing was continued, although somewhat slower than natural. This was a proof of the respiration having gone on where there was absence or death of one of the vagi nerves.

The difficulty of deglutition that was present may have partly been owing to the injury done to the pharyngeal branches. How much of the troublesome cough and hiccup he suffered from was due to the irritation of the phrenic nerve I cannot exactly tell.

The left side of the pharynx was laid open by the sloughing process, through which purulent matter passed into the mouth, and liquids and saliva from the mouth regurgitated into the wound. This circumstance added much to the unfavorable prognosis. There was difficulty in deglutition, and liquid food (the only form in which he could take nourishment) was thrown out in greater part through the opening in the pharynx, and partly through the nostrils, from the posterior palatine arches being ineffectively closed. He began rapidly to lose flesh, and life was prolonged by feeding him with the stomach-pump. The trachea and laryngeal cartilages resisted the effects of the sloughing process, consequently there was no opening that communicated with the air-passages.

For the last three or four days before death delirium was more or less present, probably from the effects of great exhaustion and the improper supply of blood to the brain, owing to the loss of one of the carotid arteries.

It is to be regretted that in this interesting case no *post-mortem* examination was allowed.

ABSTRACT OF THE PROCEEDINGS

OF THE

MEDICAL AND PHYSICAL SOCIETY OF BOMBAY,

FOR THE YEARS 1853 AND 1854.

FOR THE YEAR 1853.

Patrons,

The MEDICAL BOARD OF BOMBAY.

The DEPUTY INSPECTOR GENERAL OF HER MAJESTY'S HOSPITALS.

President,

J. MCLENNAN, M.D.

Vice-Presidents,

M. STOVELL, Esq. C. MOREHEAD, M.D.

Committee of Management,

The PRESIDENT. The VICE-PRESIDENTS.
A. H. LEITH, M.D. W. CAMPBELL, M.D.
H. J. CARTER, Esq. H. GIRAUD, M.D.

Secretary,

W. C. COLES, M.D.

The following gentlemen were elected Honorary Members of the Society, under Regulation XII. :—

Baron Liebig, of Munich; and Dr. J. Y. Simpson, Professor of Midwifery in the University of Edinburgh.

The following gentlemen were elected Ordinary Members of the Society, under Regulation V. :—

W. Leggett, Esq.; T. B. Larkins, Esq., F.R.C.S.; F. Broughton, Esq.; J. F. Steinhaeuser, Esq.; J. F. Watson, M.D.; and H. Wilson, M.D.

The following gentlemen were elected Ordinary Members, under Regulation VII.:—

T. B. Martin, Esq.; J. Lumsdaine, Esq.; J. W. Moore, Esq.; W. A. Shepherd, Esq.; H. Gane, Esq.; J. M. Barnett, Esq.; and G. Von Liebig, M.D.

The following letters were received:—

1. From the Secretary to King's College, London, acknowledging the receipt of the last four Volumes of the Society's Transactions.

2. From the Officiating Secretary Medical Board, No. 2755 of 1852, Nos. 48, 65, 88, and 133 of 1853, forwarding Cases and Papers for the use of the Society; and No. 250 of 1853, acknowledging the receipt of the 1st Volume of a new series of the Transactions.

3. From J. McLennan, Esq., M.D., on being re-elected President of the Society for the ensuing year.

4. From M. Stovell, Esq., on being re-elected Vice-President.

5. From the Secretary to the Native Book Club, applying for a set of the Society's Transactions.

6. From R. H. Davidson, Esq., Surgeon, with reference to his Subscription.

7. From J. F. Watson, M.D., intimating his wish to continue a Member of the Society.

8. From the Officiating Principal of the Grant Medical College, acknowledging the receipt of the 1st Volume of a new series of the Transactions.

9. From the Military Secretary to His Excellency the Commander in Chief, ditto ditto.

10. From the Deputy Inspector General of Her Majesty's Hospitals, ditto ditto.

11. From J. Welsh, Esq., ditto ditto.

12. From Revd. D. O. Allen, with reference to the transmission of copies of the Transactions to America.

13. From the Secretary to the Medical Board, Nos. 446 and 457 of 1853, forwarding Cases for the use of the Society.

14. From the Librarians to the Royal Medical and Chirurgical Society, London, dated 12th November 1852, acknowledging the receipt of the first ten Volumes of the Transactions.

15. From the Librarian of the Royal College of Physicians, Edinburgh, dated 24th November 1852, ditto ditto.

16. From the Curators of the University Library, Edinburgh, dated 1st December 1852, ditto ditto.

17. From the Secretaries to the Royal Medical Society of Edinburgh, dated 3rd January 1853, ditto ditto.

18. From the Secretary to the Glasgow Medical Society, dated 4th January 1853, ditto ditto.

19. From James Syme, Esq., Regius Professor of Clinical Surgery in the University of Edinburgh, on being elected an Honorary Member, and on receipt of the Transactions, dated 20th and 24th November 1852.

20. From Dr. Alison, Professor of Medicine in the University of Edinburgh, ditto ditto.

21, 22. From J. Murray, Esq., and H. Johnstone, Esq., late Surgeons Bombay Army, on being elected Corresponding Members, and on the receipt of the 10th Volume of the Transactions.

23. From the Secretary to the Grant College Medical Society, dated 15th

February 1853, acknowledging the receipt of the 1st Volume of a new series of the Transactions.

24. From the Secretary Medical Board, Madras, dated 19th February 1853, ditto ditto.

25. From the Secretary to the Council of the Medical College, Madras, dated 23rd February 1853, ditto ditto.

26. From J. F. Steinhaeuser, Esq., and T. B. Beatty, Esq., Assistant Surgeons, dated 10th and 17th February 1853, acknowledging the receipt of the 1st Volume of a new series of the Transactions.

27. From F. J. Joynt, Esq., Assistant Surgeon, dated 25th November 1852, acknowledging the receipt of the Index to the Transactions.

28. From J. Pirie, Esq., Assistant Surgeon, dated 5th March 1853, forwarding a Communication for the Society.

29. From the late R. J. Graves, M.D., M. R. S. A., Dublin, (late an Honorary Member of the Society,) acknowledging with thanks the receipt of the last Volume of the Transactions, dated 18th January 1853.

30. From R. Christison, M.D., President of the Royal College of Physicians, Edinburgh, on being elected an Honorary Member of the Society, and upon receipt of the Transactions, dated 3rd May 1853.

31. From J. W. Cusack, M.D., Stevens Hospital, Dublin, ditto ditto, dated 16th March 1853.

32. From J. McAlister, Esq., Residency Surgeon, Bushire, with reference to his Subscription, dated 12th March 1853.

33. From H. Wilson, Esq., M.D., Assistant Surgeon, requesting to become a Member of the Society, dated 19th March 1853.

34. From J. G. Lumsden, Esq., Secretary to Government, sanctioning the Bill for 100 copies of the last Number of the Transactions, letter No. 717 of 1853, dated 5th March 1853.

35. From the Secretary to the Geographical Society, Bombay, forwarding Volume X. of the Geographical Society's Transactions, and acknowledging the receipt of the first Number of a new series of the Medical and Physical Society's Transactions, dated 30th March 1853.

36. From the Secretary to the Native Book Club, Bombay, acknowledging with thanks the receipt of a complete set of the Society's Transactions, dated 15th April 1853.

37. From the Secretary Medical Board, Bombay, No. 828 dated 5th April 1853, No. 835 dated 25th April 1853, No. 896 dated 5th May 1853, No. 956 dated 11th May 1853, No. 1016 dated 19th May 1853, No. 1036 dated 21st May 1853, No. 1092 dated 28th May 1853, No. 1134 dated 3rd June 1853, and No. 1183 dated 10th June 1853, forwarding selected Cases, Returns, and Reports for the use of the Society.

38. From the Principal Grant Medical College, forwarding a copy of the last Report of the College, dated 22nd June 1853.

39. From T. W. Nunn, Esq., 17 Stratfordplace, London, forwarding a copy of each of his Essays, dated 12th May 1853.

40. From Sir George Ballingall, M.D., Regius Professor of Military Surgery,

Edinburgh, and Honorary Member of the Bombay Medical and Physical Society, acknowledging the receipt of the four last Volumes of the Society's Transactions, dated 2nd June 1853.

41. From the Acting Secretary to the Council of the Medical College, Madras, acknowledging the receipt of the 1st series of the Society's Transactions, consisting of ten Volumes, dated 8th July 1853.

42. From the Secretary to the Medical Board, Bombay, No. 1354 dated 13th July, No. 1471 dated 29th July, and No. 1504 dated 3rd August 1853, forwarding Cases and Reports for the use of the Society.

43. From the Secretary to the Medical Board, Bombay, No. 1420 of 1853, forwarding the Annual Report of the Hospital of the Head Quarters 1st Bombay European Regiment (Fusiliers), of the European General Hospital, and of the Jamsetjee Jejeebhoy Hospital, for the official year ending 31st March 1853.

44. From the Superintendent of the Government Observatory, No. 70 of 1853, forwarding, by direction of the Right Honorable the Governor in Council, one copy of the Magnetical and Meteorological Observations made at the Observatory during 1850.

45. From Mr. James Chesson, Bookseller, No. 27, Meadow Street, Fort, Bombay, on being appointed Agent for the sale of the Society's Transactions.

46. From the Secretary to the Medical Board, Bombay, Nos. 1916 and 1948, forwarding, by direction of the Medical Board, Cases of interest for the use of the Society.

47. From H. Wilson, Esq., M.D., dated Calcutta, 8th September 1853, relative to his election as an Ordinary Member of the Society.

48. From the Secretary to the Medical Board, Bombay, Nos. 1996, 2022, 2120, and 2188 of 1853, forwarding Cases and Returns for the use of the Society.

49. From Dr. Hall, Deputy Inspector General of Her Majesty's Hospitals, Bombay, forwarding an interesting Medical Case, dated 19th October 1853.

50. From the Secretary to the Bombay Native Library and Reading Room, with reference to the obtainment of copies of the Society's Transactions, dated 19th October 1853.

51. From the Secretary to the Medical Board, Nos. 2373 and 2539, forwarding Cases of interest for the use of the Society.

52. From James Bird, Esq., M.D., Foreign Secretary to the Epidemiological Society, London, dated 19th August 1853, acknowledging the receipt of the first ten Volumes of the Medical and Physical Society's Transactions, and intimating that copies of the Epidemiological Society's Report on Vaccination printed by order of Parliament will be forwarded through the Honorable Court of Directors for the use of the Society.

53. From R. W. Rothman, Esq., Registrar to the University of London, dated 19th October 1853, acknowledging the receipt of the 1st Volume of a new series of the Society's Transactions.

Original Communications, presented by the Authors.

1. Cases of Snake-bites occurring in Scinde. By T. M. Lownds, M.D.

2. Notes upon Cases of Interest treated in the Clinical Surgical Wards during the Session 1852 and 1853. By G. R. Ballingall, M.D.

3. Notes upon Natural History. By J. Pirie, Esq.
4. Observations accompanying a portion of diseased Parietal Bone. By F. S. Arnott, M.D.
5. Remarks upon Beri-beri. By C. Morehead, M.D.
6. Case of attempted Suicide. By T. M. Lownds, M.D.
7. Case of Idiopathic Tetanus. By T. B. Beatty, Esq.
8. On the use of Electro-galvanism in the treatment of Dracunculus. By F. Broughton, Esq.
9. On the Conversion of Guinea-worm into Carbonate of Lime. By. G. R. Ballingall, M.D.
10. Clinical Report of Pneumonia. By C. Morehead, M.D.
11. Note on Dracunculus in the Island of Bombay. By H. J. Carter, Esq.
12. Decennial Return of the Age, Caste, Country, and Casualties of the Bombay Army. By Lieut. Col. G. J. Jameson, Military Auditor General.
13. On the Laws of Homolagous Composition. By H. Giraud, M.D.
14. A Case of Fatal Hæmorrhage from Laceration of the Parietal Vein. By H. J. Carter, Esq.
15. Summary of Experiments made with the Somali Arrow-Poison. By R. Haines, M.B.

Communications presented by the Medical Board.

1. A Case of Aneurism of the Arch of the Aorta.
2. Cases of Cholera treated by Chloroform, Calomel, and Quinine.
3. Case of Malignant Fungous Tumour affecting the upper Jaw.
4. Cases of Fever occurring at Bhooj, with reference to the fall of Rain.
5. Observations on a Somali Arrow-Poison.
6. Sanatory Report of the Indian Navy for 1851-52.
7. Abstract of the Strength, Admissions into Hospital, and Deaths among the Honorable Company's European and Native Troops at the different Stations in the Bombay Presidency.
8. Annual Report of the Eur. General Hospital, Bombay, to 31st March 1853.
9. Annual Report of the J. J. Hospital, Bombay, to 31st March 1853.
10. Fatal Case of Compression of the Brain.
11. Fatal Case in which a portion of Brass Wire was found in the Intestines.
12. Fatal Case of Fatty Degeneration of the Heart.
13. Case of Cholera treated by Chlorate of Potash.
14. Annual Report of the Civil Surgeon, Kolhapore.
15. Ditto ditto ditto ditto Dhoolia.
16. Ditto ditto ditto ditto Nassick.
17. Case of Abnormal Conformation of the Liver.
18. Cases of Lithotomy and Operation at the Ankle-joint.
19. Case of Popliteal Aneurism and tying the Femoral Artery.
20. Ditto ditto ditto ditto ditto.

Presented by the Deputy Inspector General of H. M.'s Hospitals.

1. Case of Aneurism opening into the Pericardium.
2. Case of Convulsions before Labour.

Donations to the Library.

1. Journal of the Bombay Branch of the Royal Asiatic Society, Vol. IV. No. XVII. Presented by the Society.
2. Transactions of the Geographical Society, Bombay, Vol. X. Presented by the Society.
3. Annual Report of the Grant Medical College, Bombay, for the Session 1852-53. Presented by the Principal.
4. Outlines of Military Surgery, by Sir G. Ballingall, M.D. Presented by the Author.
5. Report on the Medical Topography of the Nizam's Army, by Dr. Riddell, Superintending Surgeon. Presented by the Author.
6. A Treatise upon Varicose Veins and Ulcers, by T. W. Nunn, Esq. Presented by the Author.
7. Upon Inflammation of the Breast, &c. ditto ditto.
8. Introductory Lecture at the Grant College for the Session 1853-54, by Dr. Morehead. Presented by the Author.
9. Magnetical and Meteorological Observations made at the Observatory, 1850. Presented by Government.
10. A Lecture upon Anatomy in relation to the Art of Design, by G. Smith, Esq. Presented by the Medical Board, Madras.

FOR THE YEAR 1854.

Patrons,

The Medical Board of Bombay.

The Deputy Inspector General of Her Majesty's Hospitals.

President,

J. McLennan, M.D.

Vice-Presidents,

M. Stovell, Esq. C. Morehead, M.D.

Committee of Management,

The President. The Vice-Presidents.
A. H. Leith, M.D. J. Peet, Esq.
H. J. Carter, Esq. H. Giraud, M.D.

Secretary,

W. C. Coles, M.D.

The following new Members were elected under Regulation V.:—R. Collum, M.D.; F. J. Joynt, Esq.; T. B. Beatty, Esq.; H. O. Thorold, Esq.; M. M. McKenzie, Esq.; and J. J. Faithful, Esq.; and under Regulation VII.:—H. Stedman, Esq.;

J. H. Sylvester, Esq.; H. Ross, Esq.; J. H. Gould, M.D.; J. D. Hewlett, Esq.; L. S. Bruce, Esq.; E. R. Butler, Esq.; J. D. Silver, Esq.; H. Bond, Esq.; A. H. Williams, Esq.

The following letters were received:—

1. From J. Hall, M.D., Deputy Inspector General of H. M.'s Hospitals, forwarding a Case and Preparation.

2. From the Secretary Medical Board, No. 2585 of 1853, forwarding Tables of the Sickness and Mortality amongst Native Troops at the different Stations of the Northern Division of the Army.

3. From the Secretary of the Medical College, Calcutta, acknowledging with thanks the receipt of the first ten Volumes of the Transactions.

4. From Messrs. Leckie & Co., forwarding the Annual Accounts of the Medical and Physical Society of Bombay.

5. From E. C. Seaton, M.D., Honorary Secretary to the Western Medical and Surgical Society of London, acknowledging the receipt of the first Number of a new series of the Transactions.

6. From B. Couzens, Esq., Medical Library, London Hospital, ditto ditto.

7. From Sir George Ballingall, M.D., ditto ditto.

8. From James Loos, Esq., Secretary and Librarian to the Colonial Medical Library, ditto ditto.

9. From J. McLennan, M.D., Physician General of the Bombay Army, on being re-elected President of the Society.

10. From the Secretary to the Native Library and Reading Room, and from the Secretary to the Juvenile Improvement Library, applying for copies of the Society's Transactions.

11. From the Secretary to the Medical Board, No. 128 of 1854, forwarding Papers for the use of the Society.

12. From W. Neilson, Esq., respecting a copy of the Transactions.

13. From T. Waller, Esq., with reference to his Subscription.

14. From the Secretary to the Medical Board, Nos. 323, 343, 378, and 387 of 1854, forwarding Cases and Reports for the use of the Society.

15. From J. R. Miller, M.D., with reference to his Subscriptions.

16. From Drs. Cogswell and Smith, Honorary Secretaries to the Medical Society of London, acknowledging with thanks the receipt of the Transactions of the Medical and Physical Society of Bombay.

17. From W. H. Smyth, Esq., Foreign Secretary to the Royal Society of London, ditto ditto.

18. From the Committee of the Medical Society of University College, London, ditto ditto.

19. From F. J. Joynt, Esq., intimating his wish to continue an Ordinary Member of the Society, agreeably to Regulation VII.

20. From T. B. Beatty, Esq., ditto ditto.

21. From H. O. Thorold, Esq., forwarding Papers to the Society.

22. From F. S. Arnott, Esq., forwarding Papers to the Society.

23. From C. Morehead, M.D., tendering his resignation of the office of Vice-President of the Society, consequent upon his departure for Europe.

24. From the Acting Secretary to the Council of the Medical College, Madras, forwarding a copy of the Annual Report of the Madras Medical College for the Session 1852-53.

25. From the Acting Principal of the Grant Medical College, forwarding the Annual Report of the College for the Session 1853-54.

26. From the Secretary to the Medical Board, Nos. 525, 560, 654, 692, 725, and 765, of March 1854, No. 863, of April 1854, No. 1054, of May 1854, Nos. 1347, 1357, 1502, 1517, and 1518, of June 1854, forwarding Cases and Reports for the use of the Society.

27. From Dr. Leith, on being elected a Vice-President of the Society.

28. From the Secretary to the Medical Board, No. 1692 of 1854, forwarding Dr. Hyslop's Paper upon Mohamreh and Bussorah.

29. From the Secretary to the Grant College Medical Society, forwarding Papers for the use of the Society.

30. From J. J. Faithfull, Esq., applying to become an Ordinary Member of the Society.

31. From T. B. Beatty, Esq., and Dr. Winchester, respecting the Transactions.

32. From the Superintendent Government Observatory, forwarding a copy of the Magnetical and Meteorological Observations made at the Observatory in 1851. Presented by Government.

33. From the Secretary to the Medical Board, Nos. 1859, 1891, and 1986 of 1854, forwarding Reports and Cases for the use of the Society.

34. From H. O. Thorold, Esq., requesting to continue a Member of the Society, in accordance with Regulation VII.

35. From the Secretary to the Medical Board, No. 2116 of 1854, forwarding Cases for the use of the Society.

36. From the Secretary to the Medical Board, Nos. 2328 and 2335 of 1854, forwarding Cases and Reports for the use of the Society.

37. From T. B. Beatty, Esq., forwarding a Case of Hare-lip for the use of the Society.

38. From H. Roome, Esq., intimating his wish to discontinue his Membership.

39. From the Secretary to the Medical Board, No. 2498 of 1854, forwarding Cases for the use of the Society.

40. From M. M. McKenzie, Esq., requesting to continue a Member of the Society.

41. From W. J. Moore, Esq., requesting to withdraw from the Society.

Original Communications, presented by the Authors.

1. Report on the Health of the 1st Bombay European Regiment (Fusiliers), from 1st April 1846 to 31st March 1854. By F. S. Arnott, M.D.

2. On some Abyssinian Diseases. By H. O. Thorold, Esq.

3. An Account of a new Anthelmintic named Moossina. By H. O. Thorold, Esq.

4. A Case of Tetanus, treated by the external application of Chloroform. By F. Broughton, Esq.

5. A Case of Præternatural Labour. By T. B. Beatty, Esq.

6. A Case of Poisoning by Aconite. By J. Peet, Esq.

7. A Case of Operation for Hare-lip. By T. B. Beatty, Esq.

8. A Case of Lithotomy. By G. R. Ballingall, M.D.
9. A Case of Aneurism of the Left Carotid Artery. By G. R. Ballingall, M.D.
10. Several interesting Medico-legal Cases. By H. J. Carter, Esq.
11. On a peculiar Disease of the Bones of the Foot. By G. R. Ballingall, M.D.

Presented by the Medical Board.

1. Tables illustrative of the Sickness and Mortality of the Native Troops at the different Stations of the Northern Division of the Army.
2. Return of Surgical Operations performed at the Civil Hospital, Hydrabad, for six months.
3. Report upon the Climate of the Hill "Supt Shring."
4. Case of Erectile Tumour of the Hand.
5. Case of Caries of the Bones of the Right Foot.
6. Case of Punctured Wound of the Plantar Arteries.
7. Two Cases of Lithotomy.
8. Medical Topography of Mohamreh and Bussorah.
9. A Return of the average Strength and Mortality among the Women and Children of Her Majesty's and the Honorable Company's European and Native Troops, for the year 1852-53, at the several Stations of the Presidency.
10. Annual Report of the Civil and Military Native Hospital at Aden, for 1853-54.
11. Annual Report of the Civil Surgeon, Rutnagherry.
12. Ditto ditto ditto ditto Kolapore.
13. Ditto ditto of the European General Hospital, to 31st March 1854.
14. Ditto ditto of the Jamsetjee Jejeebhoy Hospital, to 31st March 1854.
15. Annual Report of the 12th Regt. N. I.
16. Case of Poisoning by Opium.
17. Report on the Aden Sloughing Ulcers.
18. Fatal Case of Rupture of the Bladder.
19. Case of Snake-bite.
20. Case of Ascites.

Presented by the Deputy Inspector General of Her Majesty's Hospitals.

1. Case of Caries of the Bones at the Base of the Skull.

Donations to the Library.

1. Proceedings of the Tenth Annual Meeting of the Subscribers to the Colonial Library, Colombo. Presented by the Committee.
2. Journal of the Bombay Branch of the Royal Asiatic Society, Vol. V. Presented by the Society.
3. Report of the Madras Medical College, 1852-53. Presented by the Medical Board.
4. Report of the Grant Medical College, 1853-54. Presented by the Principal.
5. Magnetical and Meteorological Observations made at the Observatory, 1851. Presented by Government.
6. Deaths in Bombay, for 1853-54. Presented by the Medical Board.

REGULATIONS

OF THE

MEDICAL AND PHYSICAL SOCIETY OF BOMBAY.

ESTABLISHED 1835.

Objects.

I. The encouragement of the cultivation of Medical Science and its collateral branches, by discussion at periodical meetings, and by the publication of original communications.

Constitution.

II. The Society is composed of Ordinary, Corresponding, and Honorary Members.

Ordinary Members.

III. Under the head of Ordinary Members are to be classed all who contribute to the funds of the Society, and all who are admitted in accordance with Regulation VII.

IV. All Medical men residing in India, who can produce certificates of a regular medical education, are eligible as Ordinary Members.

V. Medical Officers of Her Majesty's or the Honorable Company's Service are elected Ordinary Members of the Society, on application by letter addressed to the Secretary.

VI. Qualified Medical Practitioners, not belonging to Her Majesty's or the Honorable Company's Service, are elected by ballot at the ordinary meetings of the Society, and a majority of three-fourths of the Members present is necessary to secure the election.

VII. Assistant Surgeons, on first entering the Bombay Medical Service, are considered Ordinary Members of the Society, free of the payment of admission fee and annual subscription, and continue so for a period of two years, after which should they not intimate their wish to be considered Ordinary Members by payment of the regulated admission fee and annual subscription, they are considered to have withdrawn from the Society.

Payments.

VIII. Ordinary Members pay an admission fee of Rs. 5, and an annual subscription of Rs. 12, payable in advance in the month of January of each year.

IX. Ordinary Members, absent from India, are not chargeable with subscriptions for the period of their absence.

X. Ordinary Members, neglecting to pay their annual subscription for two successive years, are considered to have withdrawn from the Society, and are liable to have their names erased from the list of Members, under a resolution passed to that effect at an ordinary meeting of the Society.

Corresponding Members.

XI. Ordinary Members, on retiring from service in India, on being proposed and seconded at an ordinary meeting of the Society, are eligible, by ballot, as Corresponding Members. A majority of four-fifths of the Members present is necessary to secure their election.

Honorary Members.

XII. Medical men of celebrity, not residing in India, are eligible as Honorary Members. On being proposed and seconded at an ordinary meeting of the Society, they may be elected at the next meeting by the unanimous consent of the Members present.

Election of Office-bearers.

XIII. The Committee of Management of the Society consists of eight Members, elected annually from among the Ordinary Members resident in Bombay, by the general vote of the Ordinary Members residing under the Government of Bombay.

XIV. The Voting Lists are circulated in the first week of November of each year, and the result of the election is declared at the annual meeting of the Society.

XV. In the event of vacancies occurring in the Committee between the periods of election, such vacancies to be filled up in rotation by the individuals who commanded the number of votes next to those of the Members returned at the last election.

XVI. A President and two Vice-Presidents of the Society are elected annually from among the Members of the Committee of Management by the Members of the Society present at the meeting at which the annual election of the Committee is declared.

XVII. The Secretary of the Society is elected biennially from among the Ordinary Members resident in Bombay at the annual meeting held in the month of January of alternate years, or, on the occurrence of a vacancy, at any other ordinary meeting of the Society.

Committee of Management.

XVIII. The Committee of Management have the general direction of the affairs of the Society, and decide on what communications are to be published in the Transactions of the Society. They keep minutes of all their proceedings,

which are entered into the Minute-book of the Society, and read at the following ordinary meeting.

XIX. When questions of importance to the stability and interests of the Society arise, they shall be submitted by the Committee for decision to the Ordinary Members residing *under the Government of Bombay*. The majority of votes necessary to decide any question, to be determined according to its importance, and fixed at the time by the Committee.

XX. It shall form part of the duty of the Committee to give due consideration to all suggestions offered by Members of the Society.

President and Vice-Presidents.

XXI. The President shall take the Chair, and conduct the business at all meetings of the Society.

XXII. In the absence of the President, one of the Vice-Presidents shall take the chair, and conduct the business of the meeting; and in case neither be present, the senior Member at the meeting shall preside.

Secretary.

XXIII. The Secretary is a Member of the Committee of Management *ex officio*.

XXIV. It shall be his duty to enter into the Minute-book of the Society minutes of the proceedings of all meetings and transactions of the Society, and, in communication with the Committee of Management, to conduct the details of business, and carry on the correspondence of the Society.

XXV. The Secretary shall prepare an annual statement of the receipts and disbursements of the Society, to be laid before the annual meeting in the month of January of each year.

XXVI. To enable the Secretary to perform these duties, a suitable establishment is entertained, under the sanction of the Committee of Management, confirmed at an ordinary meeting of the Society.

Meetings.

XXVII. Ordinary meetings of the Society are held in Bombay on the first Saturday of every month, except in April, May, and June.

XXVIII. The chair being taken, the order of business shall be as follows:—

1. The minutes of the last meeting, and those of subsequent Committee meetings, to be read and confirmed.
2. The announcement and election of new Members, in accordance with Regulations V. VI. and VII.
3. The election of Corresponding and Honorary Members.
4. The reading of letters, and the discussion of any ordinary business of the Society which may be before the meeting.
5. The announcement of presents and donations.
6. That of papers and dissertations received since the last meeting.

XXIX. After the announcement of the papers and dissertations, the President shall call upon the Secretary to read one or more of them, and shall subsequently invite the Members to discuss any particular part of them which they may consider deserving of remark.

XXX. No new business shall be introduced until that which is before the meeting has been concluded.

Papers and Dissertations.

XXXI. All papers and dissertations presented to the Society to be considered the property of the Society.

XXXII. The Transactions of the Society are published by the Secretary in communication with the Committee as often as circumstances will admit.

XXXIII. A copy of each publication is presented to the Honorary and Corresponding Members of the Society, and to every Ordinary Member who, at the time of publication, is a contributor to the funds of the Society.

N. B.—All communications addressed to the Secretary or Treasurers must be prepaid.

Members are requested to pay the amount of their subscriptions to Messrs. LECKIE and Co., Treasurers to the Society.

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